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CONTENTS AND SUBJECT INDEX

Duodenal Ulcer: The Value of the Roentgenologic Demonstration of Crater. Frederic E. Templeton, M.D.; A. W. Marcovich, M.D., Chicago, and Theodore E. Heinz, M.D., Greeley, Colo.....1807
Discussed by Drs. Althausen and Templeton.

Fascial Adhesions in Pain Low in the Back and Arthritis. Charles Murray Gratz, M.D., New York..1813
Discussed by Drs. Beyer, Telson, Key and Gratz.

The Induction of Sexual Maturity in the Genitally Hypoplastic Adult Through the Use of Testosterone Propionate. H. S. Rubinstein, M.D., Baltimore.....1818

Electrothermic Coagulation of Aortic Aneurysms. Arthur H. Blakemore, M.D., and Barry G. King, Ph.D., New York.....1821

Bronchial Asthma: Its Diagnosis and Treatment. Albert H. Rowe, M.D., Oakland, Calif.....1827
Discussed by Drs. Eyermann, Piness, Quinlan, Cohn and Rowe.

Supervoltage Roentgen Treatment of Carcinoma of the Bladder. Richard Dresser, M.D., and J. C. Rude, M.D., Boston.....1834
Discussed by Drs. Stone, Garland, Ullmann, Murphy and Dresser.

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

The Blood Sugar and Cardiac Involvement in Rheumatic Fever. Peter J. Steincrohn, M.D., Hartford, Conn.....1837

SPECIAL CLINICAL ARTICLE

The Treatment of Tuberculosis Under the Guidance of Organized Medicine: The Pennsylvania Plan for Tuberculosis. Frank Walton Burge, M.D., Philadelphia....1838

COUNCIL ON PHYSICAL THERAPY

The Effect of Heat on the Blood Volume and Circulation. H. C. Bazett, M.D., Philadelphia...1841

EDITORIALS

Normal Nutrition.....1846

Nine Years of Research on Drug Addiction 1846

The Scope and Future of Pharmacology 1847

CURRENT COMMENT

Medical Supplements in Press..1848

A Symposium on Mental Health.1848

Microscopy 1848

Dental Caries in Siblings.....1848

BUREAU OF LEGAL MEDICINE AND LEGISLATION 1875

(Subject Index on next page)

ORGANIZATION SECTION

Philadelphia Obstetric Case....1849

American Medical Association Study of Medical Care: Washington County, Iowa.....1850

Official Notes.....1854

Woman's Auxiliary.....1855

Medical Economic Abstracts....1855

A.M.A. SESSION — St. Louis — MAY 15-19, 1939

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SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics; "OS," Organization Section; "SS," Student Section.

A. M. A., hearings before grand jury in Washington OS-1854
Section representatives to Scientific Exhibit, St. Louis....OS-1854
study of medical care: Washington County, Ia. OS-1850
Acaraphobia 1870
Acid, carbonic, baths....1866
salicylic, formulas in Pharmaceutical Recipe Book 1869
Adhesions, fascial, in pain low in back and arthritis *1813
Adrenal tumor, male hormone in patients with ab-1887
Air conditioning symposium, Chicago....1856
Alcoholism, acute, diagnosis....ab-1877
American Board of Obstetrics and Gynecology, examinations 1859
Society of Tropical Medicine....1859
Androgens in patients with adrenal tumor ab-1887
induce sexual maturity....*1818
Anemia, malignant 1862
of pulmonary tuberculosis....ab-1879
Anesthesia, paraldehyde rectal, fatal injection 1863
procaine in spinal fluid....ab-1880
Aneurysms, aortic, electrothermic coagulation *1821
Anus, condylomas 1868
Arthritis, fascial adhesions in....*1813
Asthma; diagnosis; treatment....*1827
nocturnal 1868
pulmonary, ascorbic acid for....ab-1885
Backache, fascial adhesions in....*1813
Bacteremia, importance of....1860
Bacteria, pathogenic, in operating room..ab-1879
microscopy of inner structure....E-1848
survival, on ligatures....ab-1883
Baths, medicinal, at spas; production at home 1866
Bile Ducts, openings....ab-1886
Bladder cancer, supervoltage roentgen treatment *1834
Blood clotting power and vitamin K....ab-1888
clotting (electrothermic) of aneurysms..*1821
conserved, modifications ab-1885
sugar in rheumatic fever....*1837
volume and circulation, effect of heat...*1841
Board Examinations....1871
Book Notices....1872
Books Received....Adv. page 44
Bureau of Legal Medicine and Legislation.1875
Camphor, formulas in Pharmaceutical Recipe Book 1869
Cancer, International Union against....1862
polycyclic hydrocarbons which produce...1860
Cautery, electrothermic coagulation of aortic aneurysms *1821
Cement, dermatitis from....1867
Cerebrospinal Fluid, procaine hydrochloride in, after injection....ab-1880
Chicago, that obstetric case....OS-1849
Child Study Association of America 50 years old 1859
Coagulation, electrothermic, of aortic aneurysms *1821
Coitus, prostatic congestion and orgasm....1870
Colds, prevention with vaccines....C-1866
Colloids, microscopy of....E-1848
Condylomas, anal 1868
Correspondence 1866
Council on Physical Therapy....1841
Cullen, Thomas S., testimonial to....1856
Deaths 1864
Dementia Praecox, Retan's sodium chloride treatment 1869
Dermatitis from cement....1867
Diabetes Mellitus, rheumatic fever in....*1837
Diet of mother during lactation....1867
Diphtheria carriers, epidemiologic role..ab-1886
immunization, alum precipitated toxoid.ab-1878
Echinococcosis in New Zealand....1863
Endocrine Glands, sympathico-endocrine insufficiency ab-1888
Endothelioma of pleura....1870
Epilepsy, phenobarbital and belladonna in.ab-1881
Fascia, adhesions in pain low in back and arthritis *1813
Food allergy in asthma....*1827
poisoning from zinc....ab-1887
Foreign Letters....1860
Gallbladder calculi, causation....ab-1886
disease ab-1882
Genitals, hypoplasia, testosterone propionate for *1818
Gonadotropic Principles, treatment of undescended testis ab-1883
Gynecology, examinations in....1859
Pacific Coast Society of....1859
Hair, excessive, male hormone therapy..ab-1887
Harvey Lecture, second 1857
Health center, cornerstone laid, New York.1858
Kellogg Foundation increases budget for.1857
of business executive, discussion on....1856
public, dramatized at Minnesota meeting.1857
resorts, medicinal baths at....1866
Heart disease, rheumatic, and blood sugar.*1837
electrocardiograph, depression of RS-T segment ab-1877
Heat, effect on blood volume and circulation *1841
Hemophilia, female sex hormone for....ab-1887
Hemorrhage, control by snake venom....ab-1882
Hospitals, fees; corporations liability on ultra vires promise to pay....Ml-1876
Infection, focal, reduction in visual field for green not sign of....1870
Insurance, health, possible program....OS-1855
International Surgical Society....1861
Union against Cancer....1862
Iowa, Washington County: medical care.OS-1850
Jackson, Edward, to give first deSchweinitz lecture 1858
Kidney function tests: intravenous pyelography and chromoscopy....ab-1886
Lactation, diet of mother during....1867
no autointoxication from breast milk....1869
Leukocytes, action of sulfanilamide on...ab-1884
Licensure, state board must not examine foreigners, New York 1857
Lung, rheumatic ab-1884
tumors, surgical treatment....1861
Malaria, therapeutic, mapharsen treatment ab-1878
Marquette University requires county society membership 1859
Marriages 1863
Massachusetts Medico-Legal Society....1856
Masturbatio incompleta, prostatic congestion 1870
Measles, viruses in....ab-1887
Medical College of State of South Carolina, founder's day 1858
Medical Examinations and Licensure....1871
Medical Practice Acts: herbs; prescribing as practice of medicine....Ml-1875
Medical Service, Washington County, Ia. OS-1850
Medicine, organized, treatment of tuberculosis under guidance of....*1838
Medicolegal Abstracts....1875
Meetings, Coming Meetings....1876
Menstruation disorders and pulmonary tuberculosis ab-1886
Mental Disease, symptoms of pellagra...ab-1877
Mental Hygiene clinic, Hawaii....1859
symposium on E-1848
Menthol, formulas in Pharmaceutical Recipe Book 1869
Microscopy E-1848
Milk, human, no autointoxication from....1869
Mines, toxicity of types of quartz....ab-1880
Mycosis, formulas in Pharmaceutical Recipe Book 1869
Myxedema, extracutaneous localizations..ab-1885
Narcotics addiction, 9 years of research..E-1846
Nephritis, rheumatic fever and....ab-1888
Nerves, sacral roots, probable lesion....1869
Nervous System, sympathico-endocrine insufficiency ab-1888
Neurosis, anxiety states, prognosis....ab-1884
cutaneous, acaraphobia....1870
Neurosyphilis—anal condylomas 1868
News 1856
Newspapers, medical supplements E-1848
that Philadelphia obstetric case; also case in Chicago OS-1849
Nu Sigma Nu sponsors lectures....1857
Nutrition, normal E-1846
Obstetrics, examinations in 1859
Pacific Coast Society of....1859
Philadelphia case; Chicago case....OS-1849
Ophthalmological Society of Australia....1863
Organization Section....1849
Ovary hormone treatment of hemophilia..ab-1887
Oxygen bath 1866
Pacific Coast Society of Obstetrics and Gynecology 1859
Pancreatic Duct, openings....ab-1886
Paraldehyde, fatal injections....1863
Paralysis, glossopharyngeal, not related to thyroidectomy 1870
Parotitis, viruses in....ab-1887
Pellagra, mental symptoms....ab-1877
Penis, hypoplasia, testosterone propionate induces maturity *1818
pain, probable lesion of sacral roots....1869
Pennsylvania plan for tuberculosis....*1838
Peptic Ulcer and seroresistant syphilis....1867
duodenal; roentgen evidence of crater..*1807
magnesium trisilicate in....ab-1880
Pharmacology, scope and future E-1847
Philadelphia obstetric case....OS-1849
Physicians orchestra organized, New York.1858
Pleura, endothelioma 1870
Pneumonia, pathology ab-1881
Poliomyelitis, Retan's hypotonic sodium chloride treatment 1869
Prostate, congestion and orgasm....1870
Quacks, "medicine man" convicted, Pa....1858
Quartz, toxicity of various types....ab-1880
Queries and Minor Notes....1868
Rabies, death from, Illinois....1856
Radio Broadcasts....1854
Research and the state....1860
Rheumatic Fever and nephritis....ab-1888
blood sugar and cardiac involvement in.*1837
Rheumatism, lung ab-1884
Roentgenotherapy, supervoltage, in bladder cancer *1834
de Schweinitz lecture, first....1858
Sex, induction of maturity....*1818
Siblings, dental caries in....E-1848
Skin, acaraphobia 1870
reactions in asthma....*1827
Snake venom control of hemorrhage....ab-1882
Social Security, Altmeyer on three years' progress toward OS-1855
clients, care for, plan abandoned, Washington OS-1855
Society Proceedings....1870
Sodium chloride, hypotonic solution as carried out by Dr. Retan....1869
Spine, arthritis, fascial adhesions in....*1813
State Board Examinations....1871
Stomach acidity after operations....ab-1886
Stomatitis, aphthous, viruses in....ab-1887
Students, first year, physical examination..1862
Sulfanilamide, action on leukocytes....ab-1884
Surgery, International Society, congress of.1861
pathogenic bacteria in operating rooms.ab-1879
Sutures, survival of bacteria on....ab-1883
Syphilis, congenital, and treated mother—danger to obstetrician....1867
serologically latent 1869
seroresistant, and peptic ulcer....1867
Teeth, caries in siblings....E-1848
Temperature, Body, recording with standard thermometer 1870
Testis, pain, probable lesions of sacral roots.1869
undescended, antuitrin-S for....ab-1883
Testosterone propionate induces sexual maturity *1818
Thermometer, standard, recording temperature with 1870
Thyroidectomy, glossopharyngeal paralysis not related to....1870
Tonics and Sedatives....Adv. page 38
Trachoma, filtrable agent of....ab-1879
Tropical Medicine, American Society of....1859
Tuberculosis, pulmonary, and menstrual disturbances ab-1886
pulmonary, anemia of....ab-1879
treatment, under guidance of organized medicine *1838
U. S. Department of Justice, hearings before grand jury OS-1854
University of Michigan, gifts to....1857
Uterus cancer (cervical), treatment....1862
Vaccines, cold C-1866
Vasomotor Mechanism, effect of heat on..*1841
Virilism, male hormone in....ab-1887
Viruses, microscopy of....E-1848
Vision, field of, reduction in, for green not sign of focal infection....1870
Vitamin B_1, human requirements....C-1866
C treatment of asthma....ab-1885
K and clotting power of blood....ab-1888
normal nutrition E-1846
Washington County Medical Society, Ia.OS-1850
Weech, A. A., to give second Harvey Lecture 1857
Woman's Auxiliary....1855
Workmen's Compensation Acts: ammonia gas; death following inhalation....Ml-1876
Zinc, cause of food poisoning....ab-1887

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DUODENAL ULCER

THE VALUE OF THE ROENTGENOLOGIC DEMONSTRATION OF CRATER

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Present day apparatus and technic have increased the frequency with which the crater of a doudenal ulcer can be demonstrated. Many investigators still feel that duodenal deformity is sufficient for the diagnosis of ulcer and make no attempt to determine the absence or presence of crater. The demonstration of crater not only establishes activity but, as in the case of gastric ulcer, is useful in following the healing during a course of medical treatment.

DEFORMITY

Deformity of the duodenal bulb is an indirect sign that may occasionally result from extraneous influences,[1] may not be demonstrable even in the presence of a rather large crater, gives no objective clue as to the presence of active or healed ulcer and may decrease, remain stationary or increase, with resulting stenosis, during a course of medical treatment. In rare instances the deformity may be caused by adhesions or invasion of the duodenum by neoplasm. It is also claimed that spasm induced by extraneous stimuli may cause bulb deformity. Primary diverticula of the first portion of the duodenum are so rare that they need not be considered in a differential diagnosis. At necropsy healed duodenal ulcer with deformity is a frequent observation.[2] We have occasionally seen the typical purse string deformity in the routine examination of patients with pernicious anemia done to rule out gastric neoplasm. These patients, although giving no present history of ulcer, frequently admitted to ulcer-like symptoms at some time in the past. These "healed" ulcers were diagnosed by observing the evidence of a scar as indicated by fold radiation from a center, retraction and shortening of the bulb, formation of the "ulcer diverticula" and absence of a niche. However, with healed ulcer radiating folds can be entirely absent and the form of the duodenum appear normal.[3]

Since bulb deformity may be caused by contraction of scar tissue, by mucosal swelling, by muscle spasm or by any combination of the three, it seems obvious that changes in the degree of deformity are not dependable evidence as to the healing of an ulcer. To judge and compare the amount of deformity present at different examinations is extremely difficult. During healing no appreciable change in the bulb deformity took place in the majority of our cases. When the degree of deformity did change, decrease was more frequent than increase. With a few exceptions, our cases bear out the statement of White,[4] who said: "Thus far we have not seen a single markedly deformed cap which has filled out to its smooth, plump contour after treatment. Evidently a small amount of scar tissue or adhesions has persisted which still deforms the delicate walls of the duodenum." The deformity accompanying fresh ulcer and resulting from a spastic pulling-in of the margins of the bulb will not become permanent unless contraction of scar tissue occurs.

HISTORY

In 1909 Barclay[5] first described a persistent collection of barium as evidence of a duodenal ulcer. Haudek[6] in 1911 established that certain persistent collections of bismuth in the duodenal bulb represented ulcer craters. This "bismuth fleck," or "niche sign," was thought to be a rarity until 1921, when Åckerlund[7] published his first paper on the subject, based on a combination of fluoroscopic examination and filming.

In 1926 H. H. Berg,[3] who had improved Åckerlund's technic by developing "gezielteaufnahman," or "aimed exposures," published his classic monograph on the diagnosis of duodenal ulcer. He reemphasized the importance of the direct signs and described craters and their accompanying mucosal patterns, carefully checking this work against pathologic material. Berg pointed out that radiologic observations of the crater and mucosal patterns allow one to study duodenal ulcer repeatedly during treatment, whereas the surgeon and the pathologist see the lesions only at a single stage.

ANATOMIC APPEARANCE OF CRATER

During the period when the conventional surgical treatment for duodenal ulcer was gastro-enterostomy without exposure of the inside of the bulb, little pathologic material became available for direct comparison with the roentgenologic appearances. With the advent of massive gastric and duodenal resections, pathologists

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1. Barclay, A. E.: The Digestive Tract, London, Cambridge University Press, 1933. Kirklin, B. R.: Ann. Int. Med. **9**: 436-443 (Oct.) 1935.

2. (a) Portis, S. A., and Jaffé, R. H.: A Study of Peptic Ulcer Based on Necropsy Records, J. A. M. A. **110**: 6-13 (Jan. 1) 1938. (b) Crohn, B. B.; Weiskopf, Samuel, and Aschner, P. W.: The Life Cycle of Peptic Ulcer, Arch. Int. Med. **35**: 405-422 (April) 1925. (c) Stewart, M. J.: Brit. M. J. **2**: 955 (Nov. 24), 1164 (Dec. 16) 1922.

3. Berg, H. H.: Ergebn. d. med. Strahlenforsch. **2**: 249-350, 1926.
4. White, F. W.: M. Clin. North America **2**: 1431 (March) 1919.
5. Barclay, A. E.: Brit. M. J. **2**: 540 (Aug.) 1910.
6. Haudek, M.: Med. Klin. **8**: 181-184 and 224-229, 1912.
7. Åckerlund, Åke: Acta radiol., Supp. 1, 1921.

and roentgenologists were able to study the specimens and accurately compare them with the roentgenologic appearances.

Judd [8] classified ulcers into two types: (*a*) small superficial erosions not accompanied by palpable induration but surrounded by diffusely inflamed mucosa, which he termed duodenitis, and (*b*) deep ulcers, characterized by a definite crater and indurated margin.

Superficial Ulcers.—Puhl,[9] working with excised tissue, found that superficial ulcers were as frequent as deep ulcers. He stated that flat ulcers are more or less round or oval and are accompanied by radial spurs. These spurs are formed in part by the erosion and in part by the distortion of the muscular wall. The neighboring mucosa may be thick and cross hatched, may form a high wall about the crater and may contain

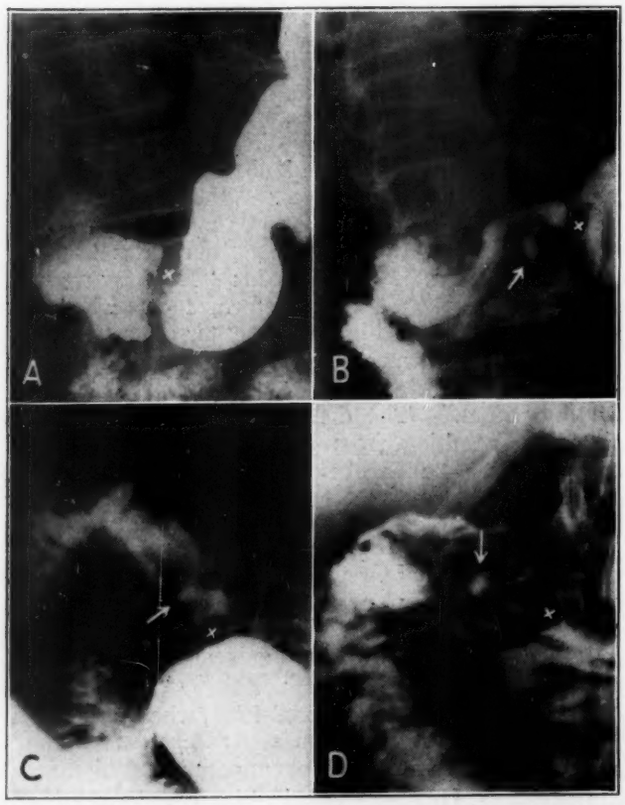

Fig. 1.—*A*, a well filled undeformed duodenal bulb. The indentation on the interior border was inconstant at fluoroscopic examination. *B*, the same bulb after application of moderate compression. Note the central collection of barium (crater) surrounded by the translucent ring (inflammatory margin). *C*, a filled deformed bulb with a faint crater lying at the center of the deformity. *D*, the bulb shown in *C* after application of pressure. The faint irregular crater seen in *C* is more prominent. The streaks radiating from the crater represent barium sulfate between folds. The arrows indicate the craters and *x* the pylorus.

numerous other erosions. Some pathologists believe that these lesions by producing edema, infiltration and scar tissue lead eventually to deformity of the duodenal bulb. Konjetzny and Puhl said that deep ulcers regularly develop from shallow ones, but Schindler, as a result of endoscopic studies on gastric ulcers, disagreed. We believe that shallow ulcers do produce the clinical picture of ulcer and do respond to ulcer treatment. Though we consider the question still unsettled, for the sake of convenience we prefer to look on duodenitis as a type of duodenal ulcer.

Deep Ulcers.—Deep ulcers may appear similar to the deeper erosions and may only be differentiated microscopically from erosions as they involve the muscularis propria as well as the mucosa and submucosa.[9] In resected surgical specimens Clairmont [10] found that duodenal ulcers are more irregular than gastric ulcers and that linear craters are rare. The crater lies at the mouth of the scar tissue pocket, if present, at the center of fold radiation. It is usually found on either the anterior or the posterior wall, whereas scar tissue pockets (ulcer diverticula) are frequent on the greater and lesser curvatures of the bulb.[11]

Multiple Craters.—Multiple craters and ulcer scars are frequently found at pathologic examination. In a series of ninety-two surgical cases of duodenal ulcer, Clairmont found multiple ulcers in fifty-four. That multiple ulcers may be overlooked on gross examination of the specimen was indicated by Gruber.[12] He stated that the reaction about an acute ulcer can be so great that it may be difficult to tell microscopically whether a second ulcer exists.

Berg [3] has thus summed up the relationship between the pathologic and the roentgenologic appearances:

> In the earliest stages of duodenal ulcer there are almost no reactive processes in the mucosa about the crater. Later, one encounters varying degrees of mucosal swelling, infiltration, connective tissue induration and, in chronic cases, involvement of the deep structures. The deep crater and rolled-up margin of a callous ulcer are easy to demonstrate, but in ulcers confined to the superficial mucosa the crater may be so shallow that it is quite impossible to demonstrate it roentgenologically in the living subject.

ROENTGENOLOGIC CHARACTERISTICS OF CRATER

Images of the bulb obtained with compression technic differ markedly from those obtained when pressure is not used. In the normal bulb fine longitudinal or spiral folds that converge at the apex are frequently found. Occasionally the pattern is cross hatched or polypoid, particularly when the organ is filmed in a partially contracted phase, and at the center of a peristaltic wave all folds become parallel. It is easier to obtain adequate patterns in pathologic bulbs than in normal bulbs. The explanation presumably lies in the inflammatory stiffening of the mucosa and submucosa.

Superficial Craters.—Since superficial ulcers not accompanied by reactive processes in the adjacent mucosa are too shallow to retain enough barium, they are rarely diagnosed roentgenologically. This fact may partially explain those cases in which there are typical symptoms of ulcer but neither roentgenologic nor gastroscopic evidence of ulcer. We have obtained a series of films, made under varying degrees of compression, in cases in which the bulb filled normally, which show faint, persistent, rounded, localized collections of barium that always recurred in the same location and were not accompanied by any demonstrable mucosal reaction. The rapid disappearance of the collection with the patient under medical management left grave doubt that a shallow erosion actually existed. In the accompanying table these cases are included under the heading active untreated, normal, because of our uncertainty as to the actual existence of a crater.

With a shallow erosion accompanied by reactive processes in the adjacent mucosa without permanent bulb deformity, the bulb is irritable and never fills com-

8. Judd, E. S.: Journal-Lancet **41**: 215-220 (April 15) 1921.
9. Puhl, H.: Deutsche Ztschr. f. Chir. **207**: 202-247, 1927.
10. Clairmont, P.: Würzb. Abhandl. a. d. Gesamtgeb d. prakt. Med. **21**: 1-59, 1924.
11. Moynihan, B. G. A.: Duodenal Ulcer, Philadelphia, W. B. Saunders Company, 1910. Harding, D. B.: South. M. J. **23**: 513-517 (June) 1930. Puhl.[9] Clairmont.[10]
12. Gruber, G. B.: Wien. klin. Wchnschr. **38**: 1253-1256 (Nov. 19), 1288-1290 (Nov. 26) 1925.

pletely. The margins are fuzzy, and the mucosal pattern has a peculiar cross hatched pattern without definite crater. There is accompanying gastric hyperperistalsis.[13] In other cases in which there is clinical evidence of active ulcer there is a permanent bulb deformity without demonstrable crater. Whether these are cases of advanced duodenitis or cases in which there is a deep crater that cannot be identified, we do not know.

Deep Craters.—The deep ulcer crater is seen sometimes "full face" and sometimes "profile." Cole [14] said:

> In some instances the ulcer is viewed in profile so that one sees its indurated edges projecting into the intestinal lumen and its crater filled with bismuth. Retention of this "bullet hole" pocket may be differentiated from pouching and from normal accumulations in the cap. In another location the bullet hole may be observed "full face" through a distorted cap or bulb.

In the full face, or axial, view, usually seen with the patient in the right anterior-oblique position, the niche generally presents a dense, sharply defined, spherical, angular to linear collection of barium lying at the center of a deformity or at the mouth of a scar tissue pocket. The niche frequently is surrounded by a clear area,

Summary of 963 Cases of Uncomplicated Duodenal Ulcer in Which Examination Was Performed with Various Compression Technics

	Roentgenologic Observations					
	Deformity		No Constant Deformity			
				Without Crater		
Clinical Status	With Crater	Without Crater	With Crater	Duodenitis	Normal Condition	Total
Active untreated*	...	...	...	10	42	809
Typical	389	225	105			
Atypical	25	6	7			
Active treated	14	24	0	0	7	45
Inactive	3†	102	0	0	4†	109
Total	431	357	112	10	53	963

* Typical indicates definite clinical evidence of active ulcer. Atypical indicates indefinite clinical evidence but adequate response to therapy. The ultimate diagnosis depended in a large measure on the roentgenologic appearances.
† For explanation of these cases, see text.

the inflammatory margin (fig. 1 *A* and *B*). In the healing phases or in the chronic stages radiating folds may appear about the crater (fig. 1 *C* and *D*) and persist after the ulcer heals. In rare cases the fleck in the crater of a deep ulcer will be so dense that it shows through the shadow of the barium-filled bulb.

In the profile view, most often obtained with the patient in the left anterior-oblique position, the crater projects from either the anterior or the posterior wall, resembling a gastric ulcer. The mouth of the crater is indented on both sides, and if sufficient compression is used the crater may be separated from the rest of the bulb by a band of decreased density. This zone of decreased density corresponds to the rolled-up margin of the crater seen in cross section. Occasionally the base of the crater is somewhat irregular, suggesting that in addition to barium it contains granulation tissue or débris.

To the anatomist, surgeon or pathologist, the various parts of the first portion of the duodenum (the duodenal bulb) are identified not so much by their geometric position relative to the frontal plane of the body as by their relationship to certain blood vessels and to neighboring structures. These workers are able to identify lesser curvature, greater curvature, anterior wall and posterior wall even though peculiarities of build or other factors have displaced the bulb from its typical relationship to the frontal plane.

This is by no means true of the radiologist. Under ideal conditions, with the patient in the full frontal or full lateral position, the parts of the bulb described by the radiologist as lesser curvature, greater curvature, anterior wall or posterior wall correspond quite well with the actual anatomy of the organ. Under adverse conditions, however, when interpretation must be based on films made with the patient in an oblique position or when the bulb is displaced from its normal position, agreement is apt to be poor. Failure to recognize this fact has led to confusion in the past. For example, Åckerlund in his earlier papers reported that ulcers may project upward from what he took to be the shortened and straightened lesser curvature of the duodenal bulb. Clairmont,[10] studying excised tissue, felt that most duodenal ulcers were located on the anterior or posterior wall of the bulb. In later papers, based on compression films, Åckerlund agreed with Clairmont that most ulcers do occur on the anterior or posterior wall of the bulb rather than on its lesser or greater curvature. Sometimes a crater on the anterior or posterior wall may be brought into profile merely by manual displacement of the bulb, without rotation of the patient, and films made after such manipulation might be misinterpreted as showing a crater on the lesser or greater curvature of the bulb.

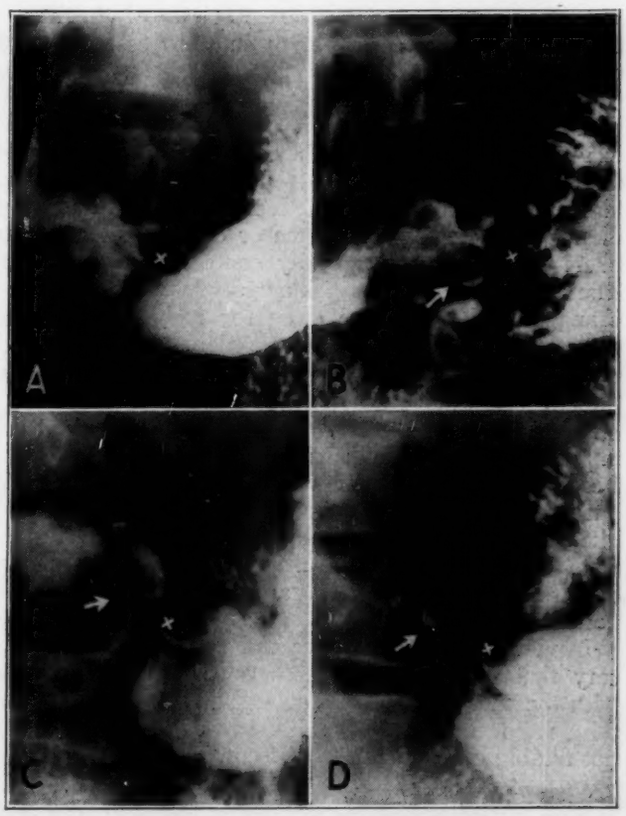

Fig. 2.—*A*, characteristic ulcer deformity in the duodenal bulb. *B*, the ulcer after application of pressure, showing the ring pattern near the base of the bulb. *C*, another ulcer, with a similar but smaller ring shadow. *D*, the ulcer shown in *C* after ten days of treatment. Note the characteristic niche at the location occupied by the ring shadow (see fig. 3).

The crater is usually located within the first 2 or 3 cm. of the duodenum, midway between the curvatures. Occasionally it is seen at the apex of the bulb or in the second portion of the duodenum.

13. Kirklin, B. R.: Radiology **12**: 377-381 (May) 1929.
14. Cole, L. G.: Lancet **1**: 1239-1244 (May 2) 1914.

Multiple Craters.—Multiple craters can be recognized but not with the frequency reported by pathologists. Berg recognized multiple duodenal ulcer craters or scars in one-half his cases. We have not been able to approach his percentage. In the axial views these craters, which fulfil all the described characteristics, may overlap each other or be entirely separate. Under manipulation they may change relationship to one another, indicating that one lies on the anterior wall and the other on the posterior wall. In the profile views they may be seen protruding one from the anterior and the other from the posterior wall.

CAUSES FOR MISIDENTIFICATION AND FAILURE TO FIND CRATER

Theoretically it should be possible to demonstrate a crater in 100 per cent of cases of active duodenal ulcer. Actually this is not the case. Reviews of the literature indicate a wide variation in the percentages of crater demonstrated by various workers. Accurate statistics on the demonstration of crater are difficult to obtain. Persons who as a routine use fluoroscopic examination combined with compression films made under fluoroscopic control demonstrate the crater in a higher number of cases of active ulcer than those using fluoroscopic examination alone or combined with films made without fluoroscopically controlled compression. The advocates of compression [15] argue that the certain changes in the bulb are often too insignificant to be detected by fluoroscopic examination. The critics of compression [16] contend that many collections of barium, though not really signifying a crater, cannot be differentiated from a crater. Åckerlund has emphasized the importance of technic and experience in such work. Berg, who has warned against overenthusiasm, points out that if there is frequent misinterpretation of crater-like shadows the method will suffer discredit. Hickey [17] stated that the method requires a relearning of the art of interpreting films, with a new conception of the normal.

In view of these criticisms and warnings, it is necessary that persons who search for craters be familiar with the causes of "false craters," the differentiation of false from true craters, and some of the reasons for not finding craters actually present.

Spurious Craters.—Spurious craters may result from barium caught in pockets formed by contraction of scar tissue; clumps of barium caught between folds, lying loose on the mucosa or lying in an overlapping second and third portion of the duodenum; and barium held in a narrowed pyloric canal or in the canal of a contracted bulb apex when these structures are seen in an axial projection. Berg has described gallstones which, when projected over the bulb, appear as craters. We have seen such a phenomenon with kidney stones. Slight rotation of the patient made differentiation easy.

The spurious crater is more easily differentiated from the true crater at fluoroscopic examination. The ulcer crater is constant, even though the bulb is allowed to fill and undergo compression several times, whereas the false crater rarely reappears at the same place and in the same shape on several successive trials. It is extremely rare to see a crater protruding from the greater or lesser curvature of the bulb near the base. This is an important point in the differential diagnosis of crater from scar tissue pockets, tonguelike processes or other collections of barium which frequently occupy these regions.

In identifying the profile views of the crater, the examiner must keep in mind that in the optimum positions, especially in the left anterior-oblique, pockets or even the lateral recesses of the obliquely placed bulb may appear as protrusions from either wall of the bulb. The profile of the crater, seen in the left anterior-oblique position, undergoes axial visualization when turned through 90 degrees into the right anterior-oblique position.

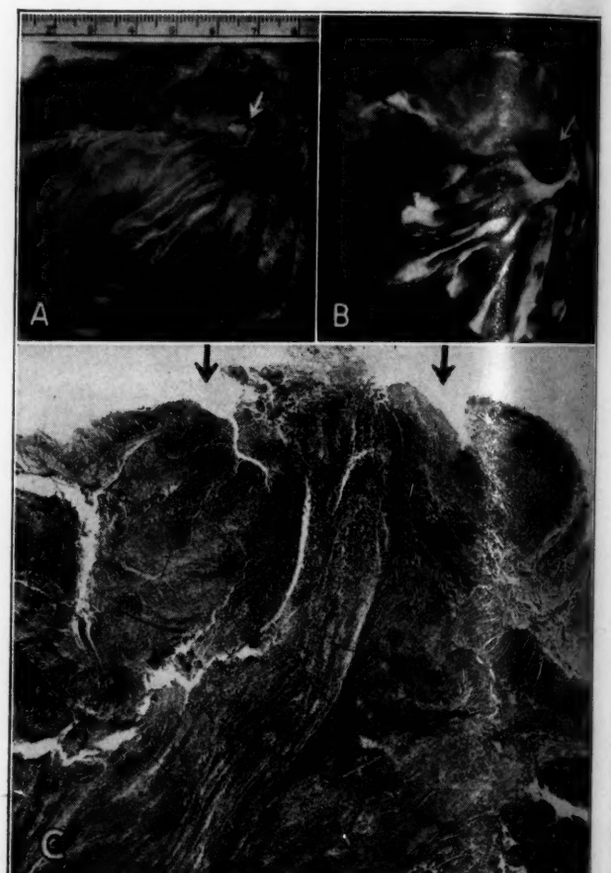

Fig. 3.—*A*, pathologic specimen of duodenal ulcer showing lymphogranulomatous tissue protruding upward from base of crater. *B*, the specimen after application of a thin layer of barium paste over the surface. The shadow of the lymphogranulomatous tissue is separated from the rolled-up margin of the crater by a ring of barium. *C*, a cross section taken through the ulcer, showing lymphogranulomatous tissue which has invaded all the layers of the duodenum. The ring pattern was produced by barium lying in the grooves (arrows) between the lymphogranulomatous plug and the margins of the ulcer.

Failure to Identify Crater.—Failure to demonstrate a typical ulcer crater does not rule out the possibility of active ulcer. The crater may be filled with deposits of mucus, a blood clot, food débris or granulation tissue, leaving no room for barium. In such cases the crater may not show until the bulb has been filled and wiped clean several times. This fact should be kept in mind in evaluating a roentgenologic report to the effect that no duodenal ulcer is present. A careless or overworked examiner may pass as normal bulbs in which an ulcer crater could eventually have been demonstrated if he had had time and patience to manipulate the bulb sufficiently to dislodge mucus and other detritus, thus allowing the crater to fill with barium.

15. Åckerlund, Åke: Am. J. Surg. **11**: 233-259 (Nov.) 1931. Bowman, P. G.: Compression Technic in Gastroduodenal Roentgen Diagnosis, J. A. M. A. **94**: 464-468 (Feb. 15) 1930. Berg.[3]

16. Buckstein, Jacob: Am. J. Digest. Dis. & Nutrition **1**: 516-520 (Sept.) 1934. Kirklin, B. R., and Burch, H. A.: Ann. Int. Med. **9**: 436-443 (Oct.) 1935.

17. Hickey, P. M., in discussion on Bowman.[15]

Forssell[18] has observed ulcer craters in which the mouth is occluded by local swelling or by puckering of the mucosa as a result of muscular contraction. Both he and Geyman[19] stated that some types of acute ulcers show no spot of greater density, being represented merely by an oval polyp-like negative pattern varying from 1 to 4 cm. in diameter. Such a pattern is evidently caused by swelling about the occluded mouth of the crater. A crater invisible at first sometimes appears after a short period of medical management, presumably because treatment decreased mucosal swelling or muscular contraction, allowing barium to enter the crater.

Berg stated that it is difficult or impossible to find the niche of a bleeding ulcer, as the loss of fluid results in a marked decrease or absence of the mucosal swelling that is often so prominent. It may have been this apparent disappearance of crater that caused Crohn and his associates[2] to state that hemorrhaging ulcers tend to heal rapidly. Our experience indicates that the time for healing varies as much with these ulcers as with those without hemorrhage. None of our patients were examined immediately after hemorrhage, which probably accounts for the fact that we have not had a perforation which could be directly or indirectly attributed to the use of compression.

We have seen a negative center in a duodenal ulcer crater in a few examinations on living subjects (fig. 2 *A* and *B*) and once in material obtained at autopsy. In some cases this shadow represents the granulation tissue plugs described by Mann.[20] We have not observed the shadow in the course of healing duodenal ulcer in human beings. In those cases in which the translucent center disappears after manipulation, it is presumably caused by food, a blood clot or débris (fig. 2 *C* and *D*). Berg has noted the end of a thrombosed artery projecting up from the floor in a case of gastric ulcer, and presumably the same thing could occur with duodenal ulcer. In the case studied at autopsy masses of lymphomatous glands were observed adhering to the duodenal bulb. An ulcer in the posterior wall of the bulb had eroded deeply, and masses of glands protruded up from the floor of the crater. Postmortem films made after the mucosa and crater were smeared with barium paste showed a frank negative shadow within the crater of the ulcer (fig. 3).

In several cases there were multiple translucent areas in the center of an ulcer crater. When first seen, one of these craters presented the conventional dense center. Nine days after the institution of treatment the center of the crater became mottled, but at subsequent examinations it was again uniformly dense (fig. 4). The cause of this mottling was not determined.

Infrequently a crater that is not seen with the patient standing appears when he lies prone or supine. In the prone position pressure may be exerted by inserting a translucent pad between the epigastrium and the surface of the roentgenoscopic table. Conversely, some craters seen with the patient standing may not be demonstrable in the other two positions.

FREQUENCY AND IMPORTANCE OF THE DEMONSTRATION OF CRATER

The accompanying table is a summary of the roentgenologic appearances in 963 cases of uncomplicated duodenal ulcer studied by us in the last four years. In fifty-three cases the bulb was termed normal, having no demonstrable deformity or crater. There was no evidence of a lesion of the stomach at gastroscopic or roentgenologic examinations. In the four cases under the heading inactive, radiating folds were seen on compression. The patients had suggestive histories of ulcer or of definite hemorrhage in the past. In the forty-nine remaining cases the clinician diagnosed active ulcer because of pronounced clinical evidence. Seven of the patients subject to rigid medical management were examined several weeks after hemorrhage. It is possible that in their cases a duodenal or gastric ulcer had healed without leaving any roentgenologic or gastroscopic trace.

In 105 of the 109 cases in which there was no clinical evidence of active ulcer, the bulb was deformed. In three of these cases the roentgenologist thought that

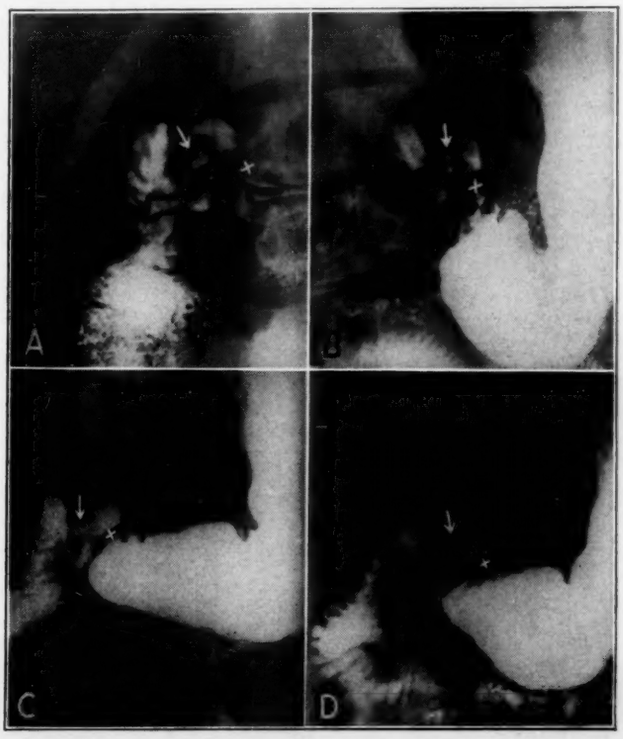

Fig. 4.—*A*, large irregular crater surrounded by a wide inflammatory margin in an undeformed bulb. *B*, the same crater nine days later. Note the mottling and indistinct margins of the crater and the radiating folds. *C*, the formation after fourteen days of treatment. The crater and the radiating folds are more prominent, but the margins of the crater remain indistinct. *D*, the area six months after treatment was started. In the region previously occupied by the crater is an indistinct collection of barium. This pattern may represent barium in the depression of an epithelized crater. The patient was symptom free.

there was definite crater as well. It is possible that these may have been cases of active ulcer with very atypical clinical evidence. Even if the roentgenologist was mistaken in his identification of crater, the percentage of error is only 0.3.

The demonstration of crater is of particular importance in diagnosing ulcer when bulb deformity is not demonstrable and in establishing activity in many of the cases in which the clinical symptoms and signs are not typical of ulcer. George[21] has stated that ulcer is not present if no deformity is present. This is probably true if the shallow erosions are excluded. Any crater penetrating into the submucosa or deeper should be seen in profile as a bulb deformity if the factors which prevent ulcer crater from filling are absent. In

18. Forssell, G., in discussion on Brastrup: Acta radiol. **3**: 217-220, 1924.
19. Geyman, M. J.: Am. J. Roentgenol. **28**: 211-222 (Aug.) 1932.
20. Mann, T. C.: J. Clin. North America **5**: 753-775 (June) 1925.
21. George, A. W., and Gerber, L.: Am. J. Roentgenol. **1**: 287-298 (May) 1914.

112, or 14.2 per cent, of the 858 cases in which there was a history of active ulcer, crater was seen but bulb deformity could not be demonstrated in the antero-posterior or right oblique position. Occasionally, however, with the left anterior-oblique position the niche could be demonstrated in profile as an outpocketing, from either the anterior or the posterior wall. In other cases the bulb was so obscured by the stomach or by the second portion of the duodenum that the profile view could not be obtained. The duration of ulcer pain varied from twenty-five years to two weeks, with exacerbations of from nine months to ten days. In only thirty-six had symptoms begun as recently as six months before. Here, then, is duodenal ulcer with chronic symptoms but without demonstrable bulb deformity, a condition which, according to Garland,[22] probably does not exist.

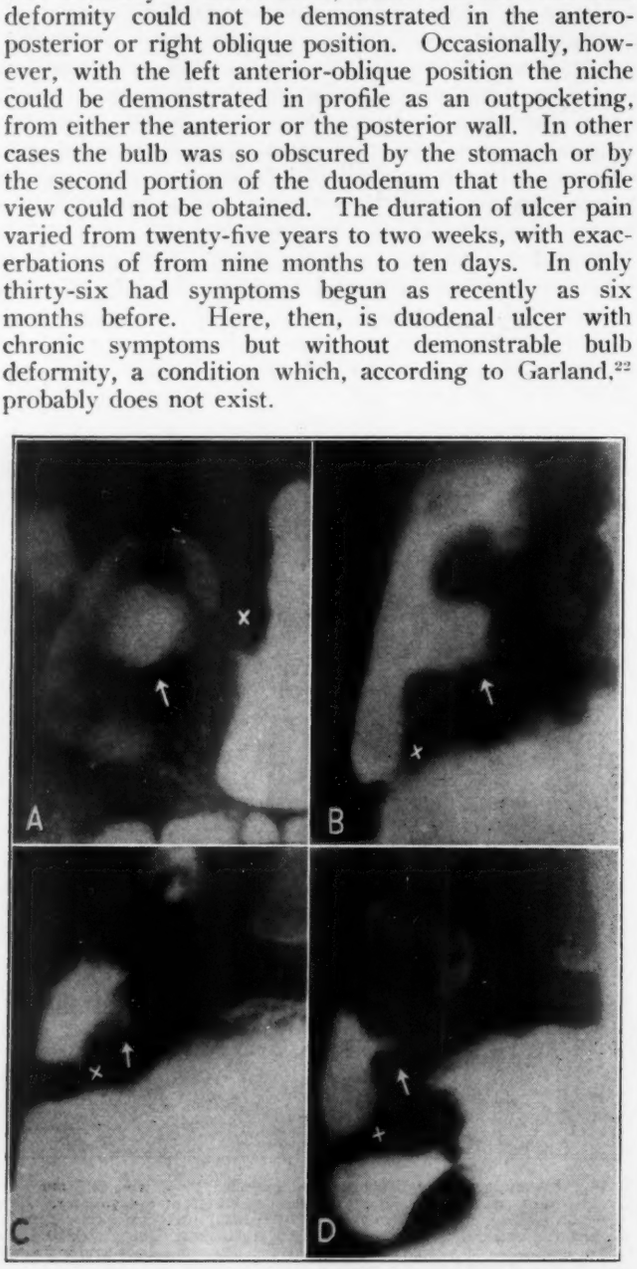

Fig. 5.—*A*, a large crater with its inflammatory margin seen in the axial projection after application of pressure. The film was made with the patient prone in the right anterior-oblique position. *B*, the same crater with the patient standing in the left anterior-oblique position. It is seen in profile projecting from the posterior wall. *C* and *D*, the same crater seen in profile sixteen days after treatment was begun. It had decreased both in depth and in diameter. Note the change in appearance as shown by the two views. The films were made within a few seconds of each other, the position of the patient remaining unchanged.

In thirty-eight cases the clinical symptoms and signs were not typical of ulcer. Crater was seen in twenty-five of thirty-one cases with deformity. In the other seven cases crater was present without demonstrable deformity. In most of these cases the identity of the crater was further established by its repeated demonstration in subsequent examination and by its gradual diminution in size during therapy. In such cases the crater is the only definite roentgenologic evidence of active ulcer. Irritability of the bulb as shown by alternating contraction and relaxation with rapid emptying is said to indicate activity of an ulcer.[13] Åckerlund stated that it is not a dependable sign. It might be argued that irritability alone is evidence of inflammation, but similar irritability in the stomach apparently is not evidence of gastritis.[23] Also, definite craters not accompanied by irritability occur in the bulb.

22. Garland, L. H.: Radiology **14**: 482-487 (May) 1930.

THE HEALING ULCER

Anatomic Changes.—The superficial ulcer usually heals rapidly without leaving any gross evidence of its existence. As to deep ulcer, the base becomes clean, coats over with fibrin and fills with granulation tissue or blood clot. The edematous margin decreases rapidly in height, and the mucosal edge progresses toward the center of the crater. These processes cause the ulcer to become shallower and to decrease in diameter. As healing progresses the central plug of tissue may project above the surface of the mucosa,[20] or the epithelium may grow down from glands of the adjacent mucosa to cover the granulation tissue of the base.[2b] Radiating folds may appear, indicating the formation of scar tissue,[24] with resulting fixation of the muscularis mucosae to the deeper layers.[25]

Roentgenologic Changes.—Under adequate medical treatment the shallow crater may disappear so rapidly that, since no scar persists to indicate the previous existence of ulceration, it seems doubtful that a fleck of barium really represented a crater.[26] In the earlier stages the rapid decrease in the edematous margin of the deeper ulcer causes the niche to diminish rapidly in depth and to a less extent in diameter. The margin becomes less sharply defined when seen axially, and funnel shaped, with the base toward the mucosa, when seen in profile. Later the crater also decreases in diameter. If the patient adheres to his treatment, the crater may disappear entirely. Some craters seem to reach a point at which they become stationary, the margins fading off to merge with surrounding shadows (fig. 4). In such cases either the crater remains unhealed for a long period or its base epithelizes, with a resulting depression. Clairmont and Haudek showed that healed ulcer could be presented as a niche. Berg, however, had not seen this in a large amount of material. Radiating folds may appear or become more prominent.

A comparison of the roentgenologic and gastroscopic methods of examination has revealed that gastric ulcer may be very small but not completely healed when the niche disappears.[23] If this is true it may be postulated that disappearance of a niche does not necessarily indicate complete healing in the case of duodenal ulcer. The decrease in size probably indicates a favorable response to therapy.[24]

The fact that some ulcers decrease or heal without the usual clinical treatment,[27] and the change in form that occurs in some ulcers during a single observation, preclude the placing of too much reliance on the roentgenologic evidence of healing in judging between various types of treatment.

A recent case in which we were able to view duodenal ulcer in profile seems to uphold the changeability of ulcer during one examination. At the first examination a 25 mm. ulcer (measured on the film) was seen axially and in profile extending from the posterior wall. We

23. Templeton, F. E., and Schindler, R.: Am. J. Roentgenol., to be published.
24. Clark, D. M., and Geyman, M. J.: Roentgen Evidence of Healing in Duodenal Ulcer, J. A. M. A. **102**: 107-112 (Jan. 13) 1934.
25. Portis and Jaffé.[2a] Clairmont.[10]
26. Berg, H. H.: Röntgenuntersuchungen am Innenrelief des Verdauungskanals, Leipzig, Georg Thieme, 1930.
27. Kalk, H.: Klin. Wchnschr. **2**: 1310-1312 (July 9) 1923.

felt that it had penetrated into the pancreas because of its size and position. In ten days it had decreased considerably in depth. In two sets of profile films taken within a few seconds of one another the ulcer seemed to change in diameter and depth with the contraction of the bulb. Seven days later the patient was again examined. Although the crater had continued to decrease in size, this time in diameter as well as depth, a distinct variation was seen in the crater, which seemed associated with contraction of the bulb. As contraction of the bulb began, the crater seemed to become deeper and narrower, and films of these changes were made (fig. 5). Three days later the patient died of coronary occlusion. At necropsy the ulcer was large and shallow and lay on the posterior wall. Its appearance did not correspond with the roentgen appearance. This was to be expected, as exact correlation of a crater with the roentgen picture can be obtained only by the immediate fixation, preferably by freezing, of the tissue removed by resection.[28] This fixation prevents the rapid loss of surrounding edema and the effect of muscle tone. In this case, however, the absence of any penetration into the pancreas and of any marked amount of adhesions or induration on the serosal surface was noteworthy. This changeability may indicate the absence of marked induration.

COMMENT

The best clinical evidence of activity and healing is the roentgenologic demonstration and the progressive and complete disappearance of the crater.[28] Our observations confirm the observations of others [29] that a large percentage of niches persist for a considerable time after symptoms are clinically relieved. In one case the existence of a persistent crater, refractory to medical treatment, was proved at postmortem examination. In another case, in which recurrent clinical evidence of ulcer was lacking, the roentgenologic evidence of crater was confirmed at operation. The recurrence of ulcers in the same place, confirmed by gastroscopic examination in the case of gastric ulcer, appeared also to occur in the case of duodenal ulcer. Our evidence strongly suggests that absence of pain and of occult blood from the stool is not in itself necessarily a definite criterion for healing, although it is a favorable sign.

CONCLUSIONS

1. By using proper roentgenologic technic, ulcer crater can be demonstrated in a high percentage of cases of active involvement. This demonstration is of great value in differentiating active from inactive ulcer and in diagnosing ulcer when bulb deformity is absent and the history atypical.

2. Demonstration of a crater is of definite significance in both treatment and prognosis. The ulcer crater seen at roentgen examination indicates that the ulcer has penetrated into the submucosa or into the deeper muscular layers; consequently the danger of hemorrhage or acute perforation is great. Absence of pain is not in itself a definite criterion of healing, for many patients under management may be symptom free even though a large niche is present.

3. Healing cannot be said to be complete until long after the crater has disappeared.

950 East Fifty-Ninth Street.

28. Ettinger, Alice, and Davis, W. E.: Am. J. Digest. Dis. & Nutrition **1**: 579-581 (Oct.) 1934. Portis and Jaffé.[26] Crohn, Weiskopf and Aschner.[20] Berg.[3] Buckstein.[16]

29. Walko, K.: Mitt. a. d. Grenzgeb. d. Med. u. Chir. **39**: 1-44, 1926. Berg.[3] Ackerlund.[18] Clark and Geyman.[24] Ettinger and Davis.[28]

ABSTRACT OF DISCUSSION

DR. THEODORE L. ALTHAUSEN, San Francisco. This is an excellent summary of the new technic of examination for duodenal ulcer. I am convinced of the value of this technic, since eight years ago I was privileged to spend a year in the medical institute at Leipzig, Germany, where Dr. Schatzki (a pupil of Berg's who originated it) was using this method, which essentially involves the giving of smaller amounts of barium sulfate, the employment of controlled compression, and the use of a snapshot attachment on the fluoroscope. In this country the roentgenologists have been rather slow in adopting the technic, I think for two reasons: In the first place, it is not easy. Even an expert roentgenologist usually has to have some training with some one who is familiar with the technic. In the second place, there has been little demand for this method of examination on the part of clinicians who have been satisfied with a clinical picture suggesting duodenal ulcer, combined with the demonstration of a deformity of the duodenal bulb by the roentgenologist. The authors should be congratulated on their excellent x-ray films. I think we all could appreciate even the finer points that were made, which is rather unusual in lantern slides of x-ray films.

DR. FREDERIC E. TEMPLETON, Chicago: There is one point I wish to make. At the University of Chicago we attempt to bring out on the films all lesions that we see at fluoroscopic examination. It is not at all frequent, but not too infrequent, that we are able to gain a lead as to the presence of a crater on the films and then go back and find it at fluoroscopic examination. Sometimes the crater is seen only on the films. Our percentages of crater demonstration, around 65, are very conservative; if we are not sure of a crater, we do not attempt to stretch the point too far.

FASCIAL ADHESIONS IN PAIN LOW IN THE BACK AND ARTHRITIS

CHARLES MURRAY GRATZ, M.D.

NEW YORK

Fascial planes function as joints synchronizing motion between muscles, groups of muscles, nerves and blood vessels. Traumatic and inflammatory lesions may involve these planes, resulting in myosynovitis or fascial adhesions. These are believed to be competent producing causes of muscular pain by involvement of the nerves and of limitation of the normal range of motion in the joint by retardation of the gliding mechanism of the muscles. A diminished power of repair of lesions involving the lower part of the back may be caused by arthritis if this term applies to the fascial as well as to the osseous joints. This paper deals with lesions involving primarily the soft tissues, and lesions involving the spinal column and its contents are therefore presumed to be excluded.

Biomechanical studies of fibrous tissues have been coordinated with gross and histologic studies of anatomy, with roentgenograms and finally with histologic sections. The therapeutic application of the aforementioned concepts to fascial surgery, with case reports, is included.

Since the entire work depends on the study of joints in relation to human locomotion, a definition may be

Read before the Section on Orthopedic Surgery at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

From the Department of Surgery, Division of Orthopedics, New York Post-Graduate Medical School and Hospital, Columbia University, and New York City Hospital.

Drs. Arthur Steindler, George Hawley and Plato Schwartz, surgeons who are pioneers in studying human locomotion, have cooperated with me for many years. Miss Willoughby Holmewood and Miss Genevieve Hunter assisted.

in order. With apologies to Webster, a joint may be described as a space functionally designed for motion. This definition includes osseous joints, the tendon moving in its sheath and the fascial spaces functioning as joints. Lesions involving primarily the osseous skeleton are not discussed in this paper. The ease and accuracy of x-ray studies of bones may account for the relatively small amount of clinical attention given to fibrous tissues. The fibrous tissues transmit stresses between the component parts of the locomotor apparatus and protect the nerves, blood vessels and lymphatics as they traverse the fascial joints. The spinal

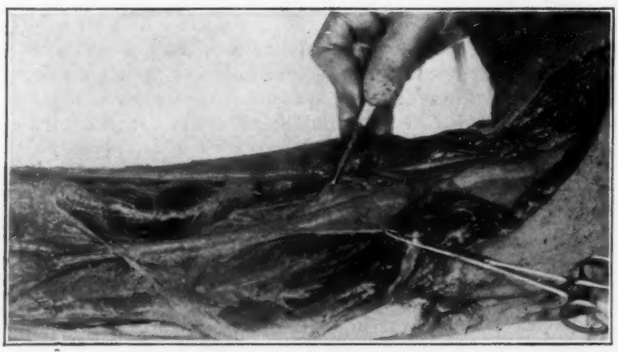

Fig. 1.—Fascial covering divided.

column similarly supports the body and protects the spinal cord and its structures. The osseous joints are protected by the ligaments and other fibrous structures surrounding them. The fascial joints, with their important contents, are protected in locomotion not only by the muscles but also by the tensile strength of the fibers of the fascial planes.

Research workers at Columbia University have presented determinations of the relative tensile properties of mammalian fibrous tissues. These data showed a comparative similarity of the ligaments and tendons to the fibers of the fascial planes. Preliminary studies of the effect of shearing stresses on fibrous tissues were included in the clinical application to fascial surgery. Traumatic lesions resulting in shear frequently are the cause of serious disability in the lower part of the back.

An etiologic diagnosis explaining the cause of obscure muscular pain has been one of surgery's major problems. The use of a contrast medium has added to the roentgenographic accuracy of diagnosis in the study of lesions involving the central nervous system and the lungs. A similar surgical and roentgenographic technic of diagnosis is suggested for lesions involving the fascial planes. The fact that many patients afflicted with obscure muscular pain are gravitating into the hands of irregular treaters of symptoms shows the urgency of solving this major economic and industrial problem. It is believed that an accurate method of first localizing the pathologic change may lead to hope of surgical correction.

The anatomic studies were similar to those of Kanavel and the late Dr. Prentiss of Iowa. Photographic studies were obtained by air insufflation. The fascial covering of the sciatic nerve was found to be insufflated with air though the planes were injected remote from the nerve. The sciatic nerve resembles a tendon in its tendon sheath (fig. 1). In some subjects the fascial covering of the nerve was adherent (fig. 2). When adhesions were dissected, the anatomic picture resembled a tendon after an acute infection. My associates and I were thus enabled to demonstrate anatomically the presence of adhesions involving the lining of the fascial space and the structures it encloses. It is not difficult to visualize the effect of such adhesions in locomotion. They are believed to be a competent producing cause of radicular muscular pain.

The same mediums and the method of insufflation were used clinically for roentgenographic study. Pneumofasciograms were thus made in a manner paralleling the surgical and roentgenographic technic of pneumocephalograms and studies of the thorax. Air in the fascial planes of relatively normal patients is evenly distributed (fig. 3). In the fascial planes of arthritic patients the air has an irregular distribution (fig. 4) and has been so reported.[1] The variation between the two forms of distribution is believed to be due to fascial pathologic change.

Biopsies of animal and human fasciae enabled us to study and present histopathologic data. The fascial fibers are normally covered with mesothelial cells of an origin similar to that of the cells lining the osseous joints and the pleural cavity. They apparently line closed spaces; otherwise the air would not be retained in the fascial spaces after injection.

The histologic and histopathologic work was done in association and is being published with Dr. L. H. Meeker. Figures 5 and 6 have been reviewed by Drs. Ward J. MacNeal and Arthur Purdy Stout and finally by Dr. Arthur Steindler. Histologically the lesions are shown by altered secretions, by "thickening of the opposing fascial surfaces or by actual adhesions."[2] The synovial covering of the muscles is frequently involved, and the lesion may then be known as myosynovitis. In the opinion of Dr. Steindler, degenerative processes such as those seen in the illustrations are probably accompanied by changes and weakening of the tensile properties of the fascial fibers themselves. Preliminary data obtained at autopsy were reviewed, and changes in the tensile properties were noted. One woman 72 years of age, invalided for many years, died of myocarditis, and we tested her tissues the day of death. They showed markedly diminished tensile

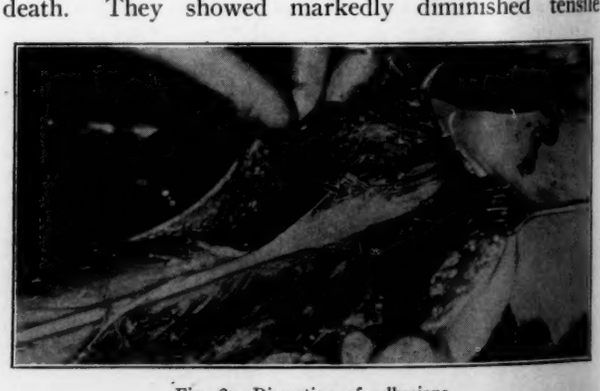

Fig. 2.—Dissection of adhesions.

strength, and the physiologic range of elasticity was practically nonexistent. Similar changes were noted in a leg amputated for endarteritis obliterans and in a leg amputated for malignant change after roentgen therapy. Only one series of test data from an arthritic patient is as yet available. The aforementioned concepts are of particular interest when correlated with the discussion of rest and may indicate the extreme care necessary when surgical intervention is deemed advisable.

1. Gratz, Charles Murray: Air Injection of the Fascial Spaces: A New Method of Soft Tissue Roentgenography, Am. J. Roentgenol. 35: 750 (June) 1936.

2. Gratz, Charles Murray, and Meeker, L. H.: The Role of Fascia in Myosynovitis, to be published.

THERAPEUTIC APPLICATIONS

The first of five conclusions of an article published in 1928 [3] was "The treatment of a patient with arthritis should be based on a complete history and physical examination, supplemented by all indicated laboratory

Fig. 3.—Even distribution of air in the fascial planes of a normal patient.

work." In 1929 there was completed a thorough study from the orthopedic standpoint of over 200 patients. In a review of their cases it was found that the medical work-up was as important as the orthopedic; hence nothing worthy of reporting was found. A study of carefully selected private patients was then begun, and it was on such patients that the air insufflations were later used. They were treated in close cooperation with their family physician, and certain of them are included in series A.

In the past ten years the principles of biologic engineering have clarified our surgical procedures, and a thorough medical examination of the patient is standard routine. Roentgenograms of the bones and cultures of the stools are a requisite to any therapy.

The correlation of human locomotion with the clinical problems is in order. In human biologic development the upright position necessitates an increased tension on the posterior group of muscles and nerves and increases the tensile and shearing stresses on the lower portion of the back. The existence of the "posterior division syndrome" and the fundamental biochemical changes necessitated by biped locomotion have recently been reported by Steindler.[4] The increasing sedentary habits of bipeds are in effect a second new deal, and recessions could be expected. The fascial joints in the lower part of the back and surrounding the sciatic nerve are apparently, like some of the bipeds themselves, "on the spot." The individual "spots" have been localized and studied by Steindler. Rheumatic lesions involving such traumatized areas are increasingly difficult to treat as the sitting-down habit keeps increasing.

Anatomic proof of fascial adhesions was found in the region of the body recently designed for sitting. The locations which we selected independently for surgical insufflation correspond to those affected by the posterior division syndrome of Steindler.

The synchronized approach to the study of defects in human locomotion permits application to the problem of pain low in the back. One must first decide whether to increase or diminish the patient's activity. To patients with an adequate physical reserve and muscular pain alone, postural exercise, walking and training of the muscles may be of real clinical value. Postural training may realine osseous structures, thus reducing shear phenomona in the functioning of dependent mesodermic structures. The patients treated by insufflation and operation were selected from those for whom an increased range of motion was desired.

For patients with acute symptoms and diminished physical reserve, rest is frequently advised. They may be admitted to the hospital immediately and kept in bed twenty-four hours a day during the time of examination. Carefully fitted supports, usually braces, are used before they are allowed to resume gradually the upright position. The fibrous tissues protecting the nerves are weakened by traumatic or infective processes, necessitating rest. Rest allows them to regain physiologic strength. Clinical judgment alone sets the dividing line between activity and rest. I am thoroughly in accord with Dr. Reginald Burbank's belief that exercise is beneficial provided pain does not per-

Fig. 4.—Irregular distribution of air in the fascial planes of an arthritic patient.

sist after the motion has stopped. I strive to have each patient establish his own tolerance to pain. When determinations of the normal safety factor of human tissues are established, greater accuracy will be permitted.

When rest in bed is advised a primitively hard bed is, with few exceptions, used. The patient is agreeably surprised at the resulting comfort. The knees are frequently flexed and the lumbar region of the back sup-

3. Gratz, Charles Murray; Wright, Irving Sherwood, and Mackenzie, Ian: Arthritis: Medical and Surgical Treatment, S. Clin. North America **8**: 443 (April) 1928.
4. Steindler, Arthur, and Luck, J. V.: Differential Diagnosis of Pain Low in the Back, J. A. M. A. **110**: 106 (Jan. 8) 1938.

ported. Light traction on the leg may be in order. These measures relieve the tension of the posterior group. The therapeutic value of rest includes that of casts, of operation on soft tissues and of surgical rest of joints by arthrodesis. These procedures have been reviewed in a previous publication.[5] It may be pertinent, however, to say that any operation on osseous structures necessitates dissection of soft tissue and is

Fig. 5.—The mesothelial covering of fascial fibers.

followed by a prolonged rest. The value of these two factors may equal that of the curative operation on the bones. Arthrodesis has a valuable role, but I am now discussing only those cases in which the primary pathologic change is believed to be in the soft tissues.

With the cooperation of G. B. Karelitz, professor of mechanical engineering, Columbia University, equipment is being devised to make use of engineering advances for the comfort and physiologic rest of bedridden patients.

The role of heat, training of the muscles and manipulations is of interest. These measures reached a high degree of perfection in the Roman civilization and are still being used. Penetrating heat in the form of local or general hyperpyrexia is probably a real advance. It is believed that heat causes an increased secretion in the fascial joints which may in selected cases result in improved function and resulting diminution of symptoms. "Moreover there is reason to believe that the temporary success in some of these cases by massage and manipulation may be explained by the releasing of secretion, the freeing of agglutinated surfaces or by breaking of adhesions, rather than by changing the anatomical position of osseous structures." [2] Theoretically and practically such measures may prove of clinical value in cases in which an increased range of motion is desired. They are included in the postoperative treatment of patients who have undergone insufflation. If the fascial adhesions are weaker than the nerves and blood vessels traversing the fascial joints, their release may prove beneficial. In cases of acute involvement the adhesions are probably nature's method of protecting weakened joints and as such may be stronger than the nerves and blood vessels themselves. Manipulation may then result in the disastrous tearing of nerves and blood vessels. The fortunate as well as the most unfortunate results of manipulation are believed to be so caused. Dr. Melvin Henderson stressed the need of approaching manipulative procedures with the same care that is used in approaching open operative corrections, if not even greater care. I use manipulative therapy and insufflation with exactly the same precautions. In all cases the patient is treated first, his symptoms are treated later and an individual program based on the result of study is outlined.

The residual group of patients who have not responded satisfactorily to any of the forms of treatment mentioned are now the major problem. Fascial disease of sufficient degree to warrant surgical insufflation or operative correction is accompanied by a definite limitation of motion. Roentgenographic localization of the fascial change precedes any operative correction.

REPORT OF CASES

Not only do insufflation and operative procedures free mechanically the fascial adhesions, but the oxygen in the air may have a definite therapeutic effect on the synovial covering of the fascial fibers. This effect is occasionally noted in thoracic and peritoneal therapy. There is little therapeutic value in freeing adhesions without first removing their cause. The patients included in series A are consecutive private patients, are all members of the residual group previously referred to and were all treated for therapeutic as well as diagnostic purposes. This series is believed worthy of a few comments. The first patient was treated by insufflation March 16, 1935, and has remained symptom free since the completion of the therapy. A patient with traumatic pain low in the back complicated by arthritis was treated by insufflation in June 1935 and has been symptom free since that time. The word cure is never used either to the patient or in reports.

Fig. 6.—High power plantar fascia in case 1 of series D. Note hypertrophy of the mesothelial cells.

For twenty-three of forty-one patients satisfactory improvement is reported. They have (1) an increased range of motion of their involved joints, (2) a definite diminution in or freedom from symptoms and (3) an increase in their useful activity. They have been observed or have reported after an accurate follow-up. For fifteen patients of series A satisfactory improve-

5. Gratz, Charles Murray: Biochemical Studies of Fibrous Tissues Applied to Fascial Surgery, Arch. Surg. **34**: 461 (March) 1937. Gratz, Wright and Mackenzie.[3]

ment of questionable duration is reported because of an incomplete follow-up. The treatment of the remaining three patients is considered a failure even though a temporary improvement followed insufflation.

Series B consists of nineteen patients from New York City Hospital reported on through the courtesy of Drs. Lyman Weeks Crossman, David Sloane and George J. Plehm. Most of them were treated for diagnostic purposes only. The series includes patients with advanced arthritic contracture following the use of a cast, with progressive muscular dystrophy and with postoperative gas bacillus infection and one apparently normal person but is not reported in detail.

Series C consists of thirty-seven patients treated at various institutions, many for diagnostic purposes only. In certain of them spectacular relief of symptoms occurred. In some the relief has persisted for over two years. Their cases are not reported in detail.

Series D consists of four patients who underwent operation. Two are from series B (patients 3 and 4). Their cases are reported in some detail:

CASE 1.—A patient aged 56 underwent operation Oct. 27, 1936, for fascial adhesions and removal of a spur of the os calcis. Fascial biopsy showed myosynovitis. This patient has been symptom free and able to indulge in full activities up to the time of last examination, Oct. 18, 1938.

CASE 2.—A man aged 47 with a history of a tear in the lumbar fascia from the crest of the pelvis, arthritis and constipation which followed the swallowing of lye when he was a child, underwent an operation Nov. 30, 1937, for fascial adhesions at the attachment of the lumbar dorsal fascia to the ileum. Roentgenograms and histologic study of sections confirmed the diagnosis of fascial adhesions. At the time of the last examination, April 23, 1938, the patient had a normal range of motion of the back and no local pain at the operative site. The condition of his abdomen, however, warranted a thorough study of this region, and it is too early to estimate the final result.

CASE 3.—A patient aged 53 underwent operation Nov. 24, 1937, after a diagnosis was made of fascial adhesions causing limitation of motion of the knee. The adhesions were divided, a biopsy specimen was taken and the fascia lata was removed from the upper side of the incision and placed between the condyles of the knee. Traction instead of a cast was used postoperatively. Examination May 4, 1938, showed that the patient's activities had satisfactorily increased and that the range of motion of the knee as a result of both types of therapy had increased from about 10 degrees to over 35 degrees. There was no pain and no instability.

CASE 4.—A woman aged 41 underwent operation Nov. 10, 1937, after a diagnosis like that in case 3. The fascial adhesions were dissected, a biopsy specimen was obtained and Bennett lengthening of the quadriceps with a living suture from the tendon of the same muscle was performed. This patient has been followed to Oct. 18, 1938, and now has 45 degrees of painless motion of the knee operated on in contrast to 5 degrees of very painful motion when she first went under treatment.

The cases reported through the courtesy of my associates (series E, F and G in the table) are included and make a grand total of 398.

SUMMARY

The surgical and roentgenographic technic of air insufflation is being reported this winter in two chapters of a new book by Dr. John Russell Carty. Special equipment has been devised for the process [6] and it is always done as a hospital procedure. The dangers of infection and embolism are great even though 398 cases are reported in which there were no complications.

Preliminary histologic work shows the need of studying fascial pathologic changes in the fasciae. If the lead of Dr. Herbert C. Clark of Panama and his associates Drs. Bates, Callender and Kelser could be followed and biopsies of the osseous and fascial tissues be included in routine postmortem examinations, much valuable information could be obtained. The concepts herein stated are merely an effort to increase the accuracy of examination of the soft tissues of the locomotor apparatus by the methods that have proved successful in studying other portions of the body:

1. Biologic engineering led to the discovery that the fascial planes of the human body function as joints.
2. The clinical application of this fact led to a study of myosynovitis and fascial adhesions.
3. Histopathologic studies confirmed the existence of fascial joints, myosynovitis and fascial adhesions.
4. These adhesions are believed to explain radicular muscular pain.
5. A coordination of all the studies led to a surgical and roentgenographic technic for the study of defects in the soft tissues of the locomotor apparatus.
6. The clinical applications are believed to show that the method can be safely applied over a period of years.

Summary of 398 Cases of Pain Low in the Back in Which Air Insufflation Was Used

	Location of Adhesions					
	Area of Posterior Division Syndrome					
	Upper Part of Back	Middle Part of Back	Lower Part of Back, Thighs	Knees	Feet	Total
	3	1	19	4	6	33
	Other Areas					
	Hand and Forearm		Shoulder			Total
	5		5			10
Series A						43
Private patients treated by air insufflation between March 16, 1935, and April 9, 1937, for both diagnostic and therapeutic reasons						
Result of treatment not relevant						2
(One patient, on whom insufflation was last performed July 28, 1935, died of unrelated causes several months later, with the parts treated in good condition; one underwent operation)						
Satisfactory improvement						23
(Increased range of motion and diminution of symptoms were definitely known)						
Satisfactory improvement of questionable duration						15
(The improvement was the same as in the preceding group, but the follow-up was not sufficiently accurate)						
Treatment a failure						3
(In two of these cases the condition was probably due to obesity, and in one it was probably a Marie Struempell process)						
						43
Series B						19
Patients at New York City Hospital, many of whom underwent insufflation for diagnostic purposes only and two of whom were operated on later						
Series C						37
Patients treated at various institutions, many for diagnostic purposes only						
Series D						4
Patients who underwent operation, no complications or infections						
Series E						20
Patients of Dr. John Russell Carty of the New York Hospital, who underwent insufflation for diagnostic purposes only; no complications						
Series F						Over 75
Patients of Dr. Abel Peck of the Charles S. Wilson Memorial Hospital, Johnson City, N. Y. Dr. Peck: "I have been very much pleased with the air injection therapy in a group of selected cases."						
Series G						200
Patients of Dr. Millard C. Beyer, Akron Ohio. Dr. Beyer: ". . . without any untoward results."						
Total patients treated without complications						398

30 East Fortieth Street.

6. Gratz, Charles Murray: A New Automatic Valve for Measuring Air Insufflations, J. Bone & Joint Surg. **19**: 835 (July) 1937.

ABSTRACT OF DISCUSSION

DR. M. C. BEYER, Akron, Ohio: A few years ago I began to inject air into fascial planes for therapy. Not having at my disposal laboratories equipped for research work, I depended on Dr. Gratz for information with regard to histopathology on this subject. I want to emphasize the fact that the cause of arthritis is not known and that the same factor which causes changes in bone may cause changes in soft tissue. It is difficult to treat these changes from the etiologic standpoint because the etiology is not known. So the symptoms are still treated. I treat symptoms by means of air injection. I find that in many cases of low back pain, when insufflations of air are made and roentgenograms are taken, definite bands of fibrous tissue are seen. I find that a normal person who can bend over and touch his toes and create an arch in his back does not exhibit fibrous adhesions in the roentgenogram. Patients with so-called lumbago were given insufflations of air, which finds its way under the lumbar fascia, and later during the process of massage to break up adhesions crepitus is elicited. I massage until the crepitus disappears. I feel, but I may be mistaken, that the crepitus is caused by the breaking up of fibrous adhesions between the muscle body and the sheath of the muscle. I give treatment and get the best results in the acute cases, the so-called cases of lumbago. A man who does heavy labor, lifting a tremendous weight, frequently will bend over to tie his shoe and will suddenly be caught with a sharp pain in his back. The patient often can be greatly benefited by insufflation of a quantity of air and then massage of the air. The muscle is loosened up so that the man stands up straight and is able to bend over and touch his toes without any pain. That effect is lasting in the majority of cases. I have given injections in well over 350 cases, and in my locality approximately 700 injections have been made without any untoward results.

DR. DAVID R. TELSON, Brooklyn: What happens when the perfectly well man stoops over to pick up a collar button, gets a terrific pain in his back, and comes up crooked? There are two explanations. The first is that the sacro-iliac joint slips. The second is that for some reason the muscle itself undergoes a sudden spasm. I believe in the second explanation, with Dr. Gratz, that abnormal adhesions exist between the fascia and the muscle. One little adhesion tears and sends the whole muscle into spasm. Why doesn't one think it is the joint? I have operated on sacro-iliac joints under local anesthesia. I have never been able to reproduce the pain shooting down a man's leg by doing anything to the sacro-iliac joint. I have been able to reproduce the pain by separating the fascia from the muscle either manually or by injecting air. At times when I put air into this fascia the man complains of exactly the same pain shooting down his leg. I do not believe that these pains can be traced on any definite nerve outline. If there is some disturbance within that muscle, the pain is relayed back to the spinal cord and then comes down to Head's area, the pathways of which one cannot trace any more than one can accurately trace a gallbladder pain referred to the back.

DR. J. ALBERT KEY, St. Louis. Apparently there is something to this injection of the fascia. I myself do not know how much. I do not know how many of these patients got better or how many would have got better if they had not had their fascia injected, but I do think that Dr. Gratz has been led astray by his pathologist and I do not believe that these spaces are lined by endothelium.

DR. CHARLES MURRAY GRATZ, New York: It is gratifying to know that many other surgeons are safely and successfully using these methods. I wish particularly to thank Dr. Beyer for his enthusiastic cooperation and to acknowledge with deep gratitude the privilege I have had of reporting the results of his studies. I wish also to thank Dr. Key for his discussion of the pathologic work shown. The existence of fascial joints and the pathologic involvement of them is the corner-stone of our entire approach to the study of low back pain and arthritis. The existence of fascial joints has been proved to the satisfaction of both the medical and the engineering professions. Anatomic and radiologic work over a period of more than three years has proved that these joints are air tight by the fact that the insufflated air remains in them. The pathologic studies have been reviewed and approved by the three eminent pathologists previously mentioned and are the foundation of the clinical work. I have purposely waited since 1935 in reporting the successful treatment of arthritic patients by fascial surgery until there has been a complete agreement of all my colleagues on the etiologic diagnosis on which the treatment is based. Hence, Dr. Key, I will not take any chance of creating an incident which might develop into a major conflict. Certain patients suffering from fascial adhesions may be successfully treated by air insufflations alone with very dramatic results. A conservative method, however, is to keep the cart behind rather than in front of the horse and use air insufflations with radiographic studies to localize the pathologic condition and permit an operative correction in selected cases. In the operative cases here reported fascial adhesions have been localized, removed, studied pathologically and plastic operations on the soft tissues successfully done in the lower part of the back, the knees and the feet. It is believed that a new ray of hope based on sound biomechanical and surgical facts may now be extended to certain of these unfortunate individuals. In addition to my colleagues previously mentioned may I in conclusion thank Dr. S. N. Blackberg, Mr. Dan Everett Waid, Prof. G. B. Karelitz and Mr. R. L. Wegel, who gave unsparingly of their time and effort over many years to help build the foundation on which our present hopes are based.

THE INDUCTION OF SEXUAL MATURITY IN THE GENITALLY HYPOPLASTIC ADULT

THROUGH THE USE OF TESTOSTERONE PROPIONATE

H. S. RUBINSTEIN, M.D.

BALTIMORE

In a recent contribution Hamilton [1] reported that through the use of testosterone propionate a man aged 27 with migraine headaches was relieved "with some degree of success" of his hypogonadism, cryptorchidism, impotence, hot flushes and mental attitude. The failure to induce spermatogenesis in this case was explained by a statement to the effect that the male hormone like the extract from the urine of pregnancy was capable only of maintaining an already existing spermatogenesis. Cases such as those reported by Hamilton are relatively scarce. It appears worth while to record all carefully gathered data regarding such patients, particularly those treated, since relatively few patients have been subjected to treatments with synthetic androgens.

REPORT OF CASE

The following study, based on clinical and laboratory observations, is therefore considered to be timely:

History.—P. C., a white man aged 31, was referred for study in March 1936 because of infantile genitalia (fig. 1). His family and early personal histories were noncontributory. He first became aware of his defect at the age of 10 years when he noticed the difference in size between his and his playmates' genitals. A physician was consulted but the mother was advised that the child would "outgrow it." He was thin until he was 13 years of age, at which time a faint crinis pubis made its

From the Research Laboratory, Surgical Division, Sinai Hospital.

The Ciba Pharmaceutical Products, Inc., cooperated by partially defraying the expense involved in this study and for supplying the testosterone propionate (perandren) used. Dr. A. E. Goldstein made the genito-urinary examination of this patient.

1. Hamilton, J. B.: Treatment of Sexual Underdevelopment with Synthetic Male Hormone Substance, Endocrinology **21**: 649 (Sept.) 1937.

appearance. From then on he became progressively fatter. During adolescence he was made keenly aware of his "failing" by his chums, so that he began to brood about it and made many unsuccessful attempts to secure a cure.

The patient was 62½ inches (159 cm.) in height, weighing 164 pounds (74.4 Kg.). The measurement from the symphysis pubis to the bottom of the feet was 4½ inches (11 cm.) more than the measurement from the symphysis pubis to the top of the head. The fat was distributed over the pelvic and shoulder girdles, breasts, abdomen and trochanters. The legs showed a lateral curvature with moderate genu valgum and flat feet.

The skin was very smooth and the face beardless, although the axillae did show a few sparse hairs. The voice was high pitched. Examination of the mouth showed an absence of all third molars (unerupted) and rather small upper lateral incisors.

The genitalia were markedly underdeveloped. The pubic escutcheon was sparse, with the apex directed distally. The penis was 2 cm. in length and only about 1 cm. in diameter (about 3 cm. in circumference). There was no evidence of hypospadias; the prepuce was partially removed by circumcision. Both testes were present within the scrotum but were only about the size of a pigeon egg. The epididymides were small and the prostate and seminal vesicles were not palpable. Neurologic examination was negative but a mental survey disclosed that he was very much concerned over his defect not, as he put it, because he was "interested in girls" but rather because his acquaintances jibed him. There were many periods of sadness and on occasion crying spells. During these periods he suffered from anorexia, constipation, insomnia and preoccupation. He made friends easily, however, because of his affability. His intelligence was of the average adult type and his sensorium was clear for tests dealing with orientation, information, memory, calculation, reasoning, reading, writing and judgment. His record as a clerk was good, although he had to leave several jobs because of the taunts of other clerks. Roentgenographic study was noncontributory, but the basal metabolic rate was minus 14 per cent.

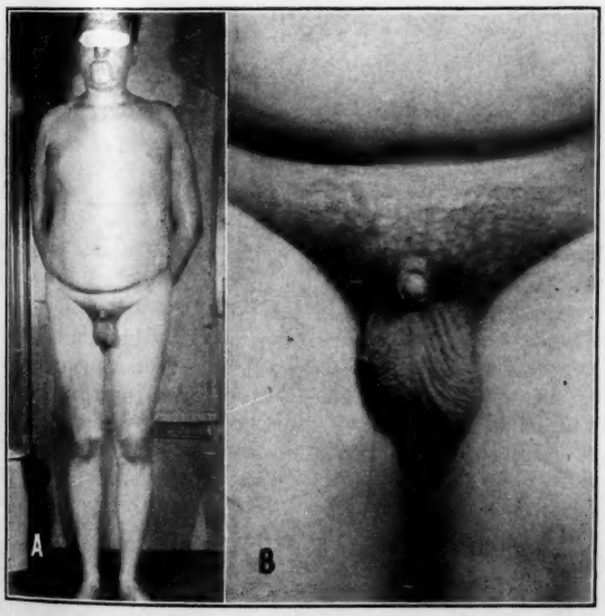

Fig. 1.—*A*, the patient March 29, 1936, before treatment. *B*, the genitals March 29, 1936, before treatment, showing infantile dimensions of penis. The testes were the size of pigeon eggs.

The diagnosis was (1) hypopituitarism (hypobasophilism with deficiency of sex hormone and hypo-eosinophilism with growth defect); (2) hypothyroidism, secondary in character, with lowered basal metabolic rate and unerupted third molars; (3) hypogonadism (probably secondary) with infantile genitalia, feminine crinis, high pitched voice, beardlessness, eunuchoid skeletal proportions, small lateral incisors, and impalpable prostate and seminal vesicles; (4) dysplastic constitution with Fröhlich configuration due to neurohypophysial involvement as evidenced by genital dystrophy, genu valgum and pes planus; (5) reactive depression with feelings of inferiority resulting from an awareness of his difference from others, the taunts of fellow workers and his own overemphasis of his plight.

The treatment as first instituted consisted of a diet of 90 Gm. of carbohydrate, 50 Gm. of protein and 60 Gm. of fat (1,100 calories); thyroid one-half grain (0.03 Gm.) three times a day; solution of posterior pituitary 1 cc. three times a week and extract of urine of pregnancy 300 rat units three times a week. In addition, psychotherapy in the form of reeducation and encouragement was employed to counteract his feelings of inferiority and hopelessness. During the next five months there resulted a definite recession of fat, a growth of the penis to 5 cm. (fig. 2) and a suggestion of a prostate gland on palpation. In addition, the voice became slightly more husky. Treatment over the course of another year which included several short injection-free periods, however, failed to show added improvement.

Fig. 2.—The genitals Oct. 4, 1936, after five months of treatment with gonadotropic substance from the urine of pregnancy (follutein). The penis is 5 cm. in length and is refractory at this time to further treatment with gonadotropic substance.

For this reason in July 1937 injections of the synthetic androgen testosterone were begun and for a period of four months the patient was given 5 mg. of the propionic acid ester of this hormone ("Perandren"-Ciba) three times a week, a total of 250 mg. While penile growth occurred, it was not striking. In the latter part of October 1937, dosage was increased to 25 mg. three times a week. After a period of one week the genitalia began showing marked changes. The penis showed an increment of enlargement which was greater than that observed during any previous corresponding period, and erections were almost continuous. December 23 the penis measured 6.5 cm. when flaccid and 9 cm. when semirigid. The most striking change, however, was in the circumference of the organ, which had increased from an original measurement of 3 cm. to one of 9 cm.

At this time the patient stated that he had very recently become interested in a girl whom he intended to marry. He further stated that a test at coitus had resulted in the escape of seminal fluid. Although the possibility of a childless marriage was explained to the patient and his intended wife they were not deterred, so that during the month of January 1938 they were married.

Sexual relations were successfully carried out daily for one week after marriage and have been continued at a pace of three times a week for a period of two months. It is interesting that no treatment was given from January 6 to January 25 (nineteen days), during which time the sex pace was maintained, both patient and partner being gratified.

February 22 the penis, which was 7 cm. when flaccid, reached a size of 10 cm. in length and 10 cm. in circumference when rigid (fig. 3).

A condom specimen obtained at this time disclosed numerous spermatozoa, but all were motionless. From other studies on spermatogenesis [2] it was known that this immotility could have resulted from the chemicals associated with the condom. For this reason a masturbation specimen was obtained March 8. This revealed many motile but also a number of immotile spermatozoa. The prostate and seminal vesicles at this time were definitely palpable, although they were not very large.

Another specimen of the ejaculate obtained March 15 revealed a total volume of 0.6 cc. with a total sperm count of 8,400,000, a number corresponding to 14,000,000 per cubic centimeter.

2. Rubinstein, H. S.: The Effect of Anterior Pituitary-like Hormone on Spermatogenesis in the Human, Endocrinology **23**:75 (July) 1938.

Viability was present, as already mentioned, and the majority of spermatozoa were of normal form. At present the patient is still under active treatment, receiving 25 mg. of testosterone twice a week.

Experimental Observations.—Since the patient displayed mature and motile spermatozoa following treatment with testosterone propionate, it became interesting to determine whether

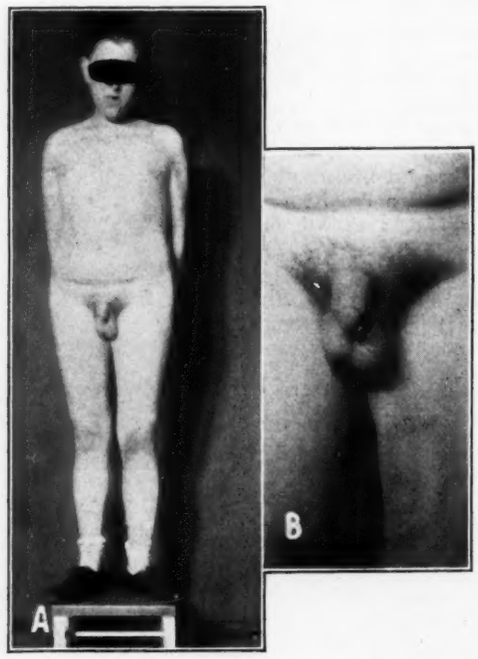

Fig. 3.—*A*, the patient Dec. 23, 1937, after treatment. *B*, the genitals Dec. 23, 1937, after treatment with testosterone propionate (perandren), showing marked growth.

this hormone had actually initiated this phenomenon in an originally immature testis or had merely stimulated a rather dormant function in a testis already capable of sperm formation.

For this purpose a group of sexually immature rats (Mus norvegicus var. albus) of Wistar Institute strain were subjected to intraperitoneal injections of this substance. Treatment was begun at 20 days (weaning age) and a dose of 1 mg. daily

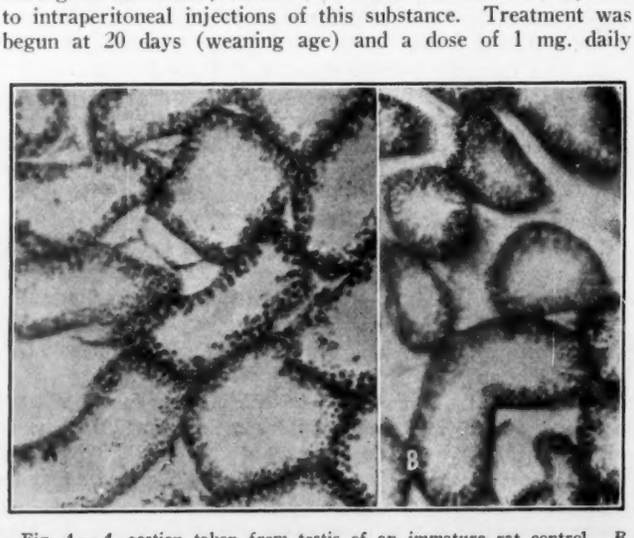

Fig. 4.—*A*, section taken from testis of an immature rat control. *B*, section taken from testis of an immature rat treated with testosterone propionate (perandren), showing thickened tubules but no increase in interstitial tissue.

(except Sunday) was given for a period of eleven days. The animals were killed twenty-four hours after the last injection, at which age spermatogenesis is still normally incomplete.

It was found that testicular descent occurred in the test animals four days after injections were begun, i. e. at 25 days of age, while the testes of the control rats did not descend until they were 32 days old.

In addition to earlier testicular descent, the genitalia of the test animals were grossly larger than those of the controls. Critical measurements, however, will be included in a detailed report of more extensive studies now under way. Microscopic examinations of the testes (fig. 4) showed a rather thickened tubular wall in the test animals as compared to the controls but no change in the interstitial elements. Mature spermatozoa were lacking in all animals but there was an increased proliferation of germinal cells as evidenced by mitotic figures, thickened tubular wall and the extrusion of immature cells (spermatocytes) into the epididymis (fig. 5).

COMMENT

It is interesting to note that the hormone used was capable of stimulating libido and of enlarging the hypoplastic genitalia of this patient to a stage at which marriage was possible, sex pace increased and marital relations satisfactorily maintained. In addition it stimulated the germinal epithelium of the testis so that ejaculation of live spermatozoa resulted. It is important to note, however, that this hormone did not bring about any change in hair distribution or beard growth.

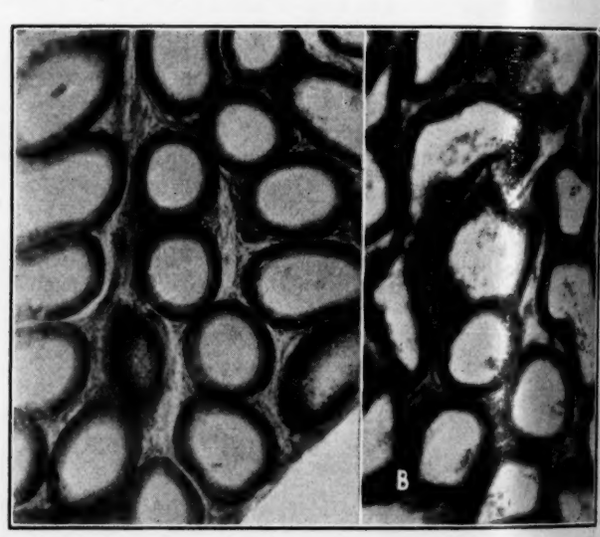

Fig. 5.—Section taken from epididymides from same animals shown in figure 4: *A*, from immature control showing empty tubular spaces; *B*, from immature test animal showing numerous premature spermatic forms in the tubular spaces.

This is noteworthy since many believe that the masculine crinis and bearded face result from the influence of the male sex hormone. In the light of recent experience, this causal relationship becomes questionable. As a matter of fact, the use of testosterone propionate in females [3] fails to incite facial hair growth. In addition, an adult patient with testes bilaterally absent from the scrotum, now under observation, shaves every other day. What is actually responsible for hirsutism is still a matter of conjecture, but from clinical experience with adrenal tumors it appears that this gland is, in a measure, a contributor to this phenomenon.

So far as the spermatogenic effect of testosterone is concerned it is important to note that this hormone acts by stimulating proliferation of germinal epithelium. Thus immature animals when treated exhibit an outpouring of immature forms (spermatocytes) into the epididymis, and mature males, as will shortly be shown,[4] react with an increase in the output of mature spermatozoa. It appears, therefore, that testosterone has the

3. Rubinstein, H. S., and Abarbanel, A. R.: The Use of Testosterone Propionate in the Treatment of Dysmenorrhea, Am. J. Obst. & Gynec., to be published.

4. Rubinstein, H. S., and Kurland, A. A.: The Effect of Testosterone Propionate on Spermatogenesis in the Human, in preparation.

same effect on the germinal portion of the testis as does the pregnancy urine extract [5] and castrate urine extract; [6] i. e. it stimulates proliferation of the germinal epithelium in the stage of development at which the testis finds itself. It differs from these other hormones, however, in that it fails to stimulate the interstitial tissue.

Since mature spermatozoa were obtained in the case reported and since testosterone as shown by experiment merely stimulates proliferation of germinal cells to a stage at which the germinal cells can develop at the moment, it means that the testis in this particular patient had reached a stage at which it could react to this hormone by an increased output of spermatozoa. What stimulated the testis to a stage at which it could so react is unanswerable at this time. From experiments in the rat it is improbable that testosterone was immediately responsible but it is difficult to gainsay the secondary effects induced by the treatment which may have played a part in producing the final picture.

The preparation used, testosterone propionate, is the most active of all the known androgens, since it has been shown that an ester of testosterone is more active than the unattached molecule [7] and that of all esters synthesized the propionate is most effective.[8]

Finally, it is important at this time to think of the testis as an organ consisting of two glands of internal secretion, (*a*) interstitial and (*b*) tubular. Since hormones fail to stimulate their own cells of origin,[9] the stimulation of the tubular gland and the lack of effect on the interstitial gland lead one to assume that the synthetic testis hormone testosterone is identical with that androgen derived from the interstitial tissue.

SUMMARY AND CONCLUSION

A genitally hypoplastic man six months after cessation of response to treatment with gonadotropic substance from the urine of pregnancy was subjected to injections of testosterone propionate. This substance was injected intramuscularly in 5 mg. doses three times a week from the latter part of July to November 1937. Dosage was then increased to 25 mg. three times a week. In January 1938 the genital condition had become improved to such a degree that the patient married, cohabited and ejaculated live spermatozoa. While the voice became somewhat deeper, distribution of hair and the initial beardlessness remained unchanged.

Laboratory studies on the effect of this hormone on the testis disclosed a stimulation and proliferation of germinal epithelium but failed to reveal a hastening in maturation of the testes. It was concluded, therefore, that in this case secondary effects may have been responsible for first causing the germinal epithelium to reach such a stage of maturation and that further treatment with testosterone resulted in the proliferation and discharge of mature and live spermatozoa.

2349 Eutaw Place.

5. Rubinstein, H. S., and Radman, H. M.: A Comparative Study of the Gross and Microscopic Effects of the Follicle Stimulating Hormone and Anterior Pituitary Sex Hormone on the Rat Testis, Am. J. Physiol. **122**: 319 (May) 1938.

6. Rubinstein, H. S.: The Effect of Castrate Urine Hormone on the Testis, Endocrinology **23**: 171 (Aug.) 1938.

7. Miescher, K.; Wettstein, A., and Tschopp, E.: The Activation of the Male Sex Hormones, Biochem. J. **30**: 1970, 1977 (Nov.) 1936.

8. Kochakian, C. D.: The Comparative Efficacy of Various Androgens as Determined by the Rat Assay Method, Endocrinology **22**: 181 (Feb.) 1938. Loewe, S.: A Pharmacological Ejaculation Test for Bio-Assay of Male Sex Hormone, Proc. Soc. Exper. Biol. & Med. **37**: 483 (Dec.) 1937.

9. Collip, J. B.: Some Recent Advances in the Physiology of the Pituitary, J. Mount Sinai Hosp. **1**: 28 (May-June) 1934.

ELECTROTHERMIC COAGULATION OF AORTIC ANEURYSMS

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Observations of inactivity in saccular aneurysms completely filled with an organized blood clot have established the efficacy of "nature's cure." The principle of inserting wire into an aneurysm to induce clotting is basically sound.

The first attempt to inactivate an aneurysm by wiring is attributed to Moore in 1864.[1] Fifteen years later Corradi [1] suggested insulating the needle through which wire is passed into an aneurysm and connecting the protruding end of the wire to the positive pole of a battery, applying the negative electrode to the skin in the vicinity of the aneurysm. Application of from 50 to 100 milli-

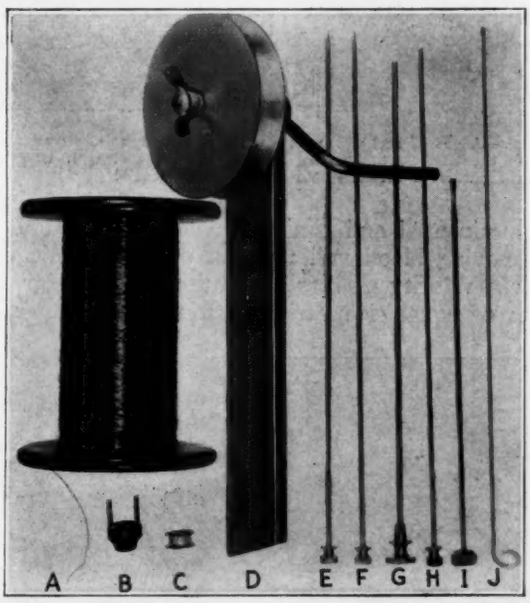

Fig. 1.—*A*, enameled wire on spool; *B*, electrode cap, adapted to *H*; *C*, self-retaining skin retractor; *D*, hand reel for winding wire on spools; *E*, a trocar pointed stylet adapted to G for traversing firm tissues and piercing the sac of the aneurysm; *F*, tapered blunt stylet adapted to *G* for traversing tissue of lung; *G*, 14 gage 6½ inch needle made of stainless steel, with the end beveled from without in; *H*, inner sheath for needle *G*, which locks in place and has the end beveled from within out, fitting exactly with needle *G* to furnish a rounded, nonabrasive end; *I*, wire passer adapted to *H*, and *J*, a blunt stylet adapted to *H*.

amperes resulted in the formation of an ionization product at the surface of the wire in contact with the blood. The wire generally used was a 29 gage wire of gold or silver alloy. This method of wiring aneurysms was most popular in America.

Colt [1] more recently devised and popularized in England a collapsible wire cage which could be introduced through a needle and expanded in the aneurysm.

Read at a section meeting of the American College of Physicians, New York, April 8, 1938.

From the Department of Surgery, Presbyterian Hospital, and the Department of Physiology, Columbia University College of Physicians and Surgeons.

A. R. Kemp and C. S. Fuller of the Bell Telephone Company helped to develop a suitable insulation for the wire. Prof. K. S. Cole of the Department of Physiology, Columbia University College of Physicians and Surgeons, and Mr. P. W. Spence of the Bell Telephone Laboratories advised and cooperated in the development of the electrical technic employed. Morris Eckman of the Department of Gas Therapy, Presbyterian Hospital, designed and constructed the reel. Frederick C. Wappler of the American Cystoscope Company designed and made the wire passer and needle. The wire was furnished by Baker & Co., Inc., of Newark, N. J.

1. Keen, W. W.: Surgery: Its Principles and Practice, Philadelphia, W. B. Saunders Company, 1921, vol. 5, pp. 216-349.

A thorough review of the literature led to the conclusion that the operation of wiring aneurysms as it has been performed fails to give satisfactory results. Relief of pain seemed consistent but rarely was maintained. A few aneurysms grew less rapidly. Occasionally a brilliant success resulted from the procedure. However, the results in most cases were discouraging.

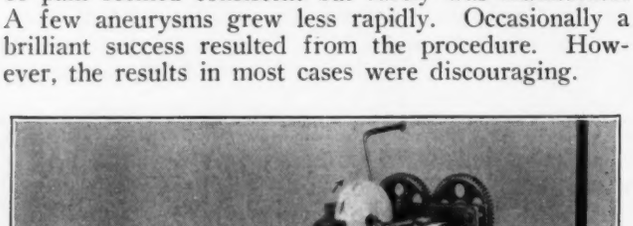

Fig. 2.—A geared reel which serves to rotate the spools in opposite directions as the wire is unwound. An aneurysm model with wire within. The wire passer is screwed into place on the needle.

Experimental and clinical studies convinced us that fast moving blood will not clot on wire. We found that the velocity of blood flow through saccular aneurysms of equal size varied as much as 300 per cent,

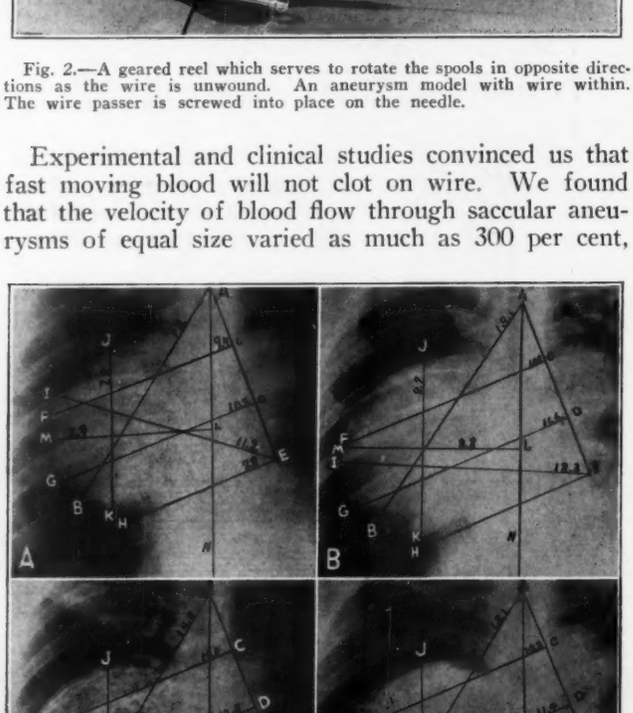

Fig. 3 (case 5).—View *A* was taken March 30, 1931; view *B*, Jan. 25, 1933; view *C*, Jan. 11, 1935, and view *D*, Feb. 20, 1936, eleven months after wiring and electrothermic coagulation. View *D* was taken after the injection of 20 cc. of diodrast into the aneurysm. Measurements: *A-N*, midline vertical; *M-L*, the farthest border of the aneurysm; *A*, posterior spine of the seventh cervical vertebra, and *E*, a point at the lateral edge of the thoracic aorta determined by a compass one leg of which is set at *A*, 13 cm. distance. With *A-E* as a base line, equidistant points *C*, *D* and *E* are taken, from which parallel lines *C-F*, *D-G* and *E-H* are projected to the lateral border of the aneurysm. *A-B* is the distance from *A* to the farthest edge of the aneurysm. *E-I* is the distance from *E* to the farthest edge of the aneurysm.

depending on the size of the opening into the sac. Former methods of wiring aneurysms afforded no index of blood velocity as a guide to the amount of wire necessary in a given case. It is probable that the extremely variable results following the procedure may be explained on the basis of incomplete clotting.

We wish to present a method of wiring aneurysms in which the blood velocity, not the size of the aneurysm, indicates the amount of wire necessary to retard the rate of flow to a point at which complete mass clotting takes place. The results in eleven cases in which aneurysm of the aorta was operated on by this method are of sufficient interest to report in detail.

There is a general impression that aneurysms have become less common. Moore,[2] however, reported that nearly 100 per cent of the women and from 30 to 49 per cent of all patients with cardiovascular syphilis have no knowledge of the beginning or the presence of syphilis. This makes it seem likely that aneurysms will occur for many years to come.

During the twenty year period from 1917 to 1936 there were 456 patients with aneurysm admitted to the Presbyterian Hospital and Vanderbilt Clinic. Of the aneurysms, 397 (87 per cent) were of the aorta. There were 232 cases from 1917 to 1928 and 224 cases from 1927 to 1936.

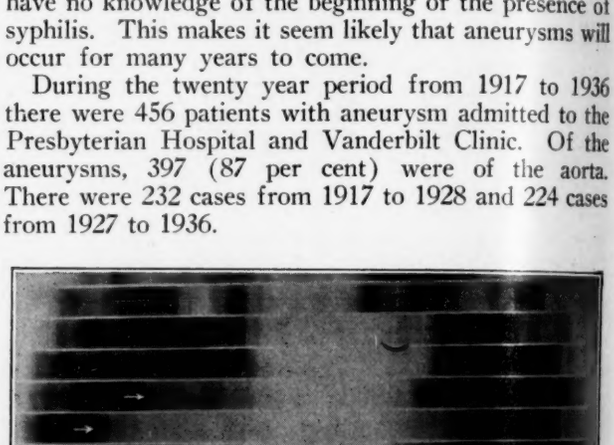

Fig. 4 (case 5).—Roentgenkymogram of the heart and saccular aneurysm of the ascending arch two years and two months after wiring. Note the absence of pulsation of the wall of the aneurysm (arrows).

It is reasonable to attribute to the Wassermann test and modern antisyphilitic therapy a great part in the prevention of aneurysms. Once the yellow elastic tissue of the aorta has been destroyed and the media so weakened by endarteritis, however, the resulting aneurysm introduces into the circulation a new and vicious mechanical factor. The wisdom of trying to eliminate the spirochete from the aneurysm cannot be denied. Conceding the benefits of bed rest, the unfortunate patient faces today the same old threats of sudden death by rupture, a lingering death by strangulation or acute distress from pressure symptoms. It is only necessary to compare these results with the occasional "nature's cure" seen at necropsy to appreciate the significance of complete clotting in arterial aneurysms.

In a study of sixty-one necropsy specimens of aneurysm of the aorta, complete clotting was noted in six (14 per cent) of the forty-two saccular aneurysms. Nineteen (25 per cent) of the sixty-one aneurysms were of the fusiform variety. In seven (37 per cent) of these, concentric clotting had narrowed the lumen available for blood flow to a diameter equal to or less than the

2. Moore, J. E.; Danglade, J. H., and Raesinger, John C.: Cardiovascular Syphilis, Arch. Int. Med. **49**: 879-924 (June) 1932.

width of the aorta. This represents nature's cure. Rupture of the aneurysm had not occurred in a single case: death from some unrelated cause was the rule. The clotted specimens had every appearance of permanent inactivity. The patient usually had been free from symptoms attributable to the aneurysm.

The nutrition and strength of an aneurysmal sac depends largely on an outgrowth of collateral vessels about its neck. Blood, circulating under pressure, creates a strain on the wall of the sac varying with the square root of its surface area and, to a lesser extent, with the rate of the blood flow. Doubling the diameter of an aneurysm increases the strain on the sac 100 per cent. The stretched sac, further devitalized, is of course weakened. Thus there is a vicious circle in a rapidly growing aneurysm of increased strain on a wall of diminishing strength. Lowering the blood pressure by bed rest in such cases often prolongs and, no doubt, often saves life. The temporary reduction of blood pressure permits the strengthening processes within the sac an opportunity to become effective. Unless complete clotting takes place—and this rarely occurs—as the blood pressure rises, the aneurysm is again subjected to the vicious strain. In a clotted aneurysm, however, the physical laws governing solids obtain. Thus the strain on the sac of an unclotted saccular aneurysm multiplies with growth, whereas filling the sac of an aneurysm completely with a solid clot reduces the strain on the sac to that of the lateral wall pressure on the surface area of the mouth of the sac. In the case of fusiform aneurysms, narrowing the lumen to the diameter of the parent artery reduces the strain on the sac to that of the lateral wall pressure on any other equal segment of the parent artery.

It seemed likely that if a saccular aneurysm could, with certainty, be filled with a clot which was adherent to the wall of the sac, inactivation of the aneurysm and a reduction in its size might be expected to occur.

METHOD [3]

Inactivation of an aneurysm by clotting cannot be accomplished without bringing about two important conditions: (1) presence of an adequate clot-stimulating surface and (2) a sufficient reduction in the velocity of blood flow. Wire immersed in circulating blood, if heated to a temperature above the heat coagulation point of blood proteins, becomes coated with a protein coagulum which is difficult to scrape off. When introduced into an aneurysm in adequate amounts and heated it affords an excellent clot-stimulating surface of protein coagulum.

Wire introduced into an aneurysm offers an impediment to blood flow. If introduced in sufficient amounts it will slow the blood to a velocity at which, in the presence of an adequate clot-stimulating surface, complete mass clotting of the aneurysm takes place.

We have selected an alloy (silver 90 per cent, copper 10 per cent) which, when drawn into a 34 gage wire (Browne and Sharpe) has the proper electrical resistivity of heating. The small size of the wire, one half the size of that formerly used in wiring aneurysms, and its lack of spring make it safe to use in adequate amounts.

The wire is insulated with a thin coat of enamel. This makes it possible to heat it, after inserting it into an aneurysm, by connecting a battery of approximately 100 volts to the two protruding ends. Since the operator knows the temperature coefficient of resistivity of the wire, its temperature changes can be followed by bridge measurements (fig. 5). From the current values necessary to raise the temperature of the wire successively 5, 10 and 15 degrees (C.) above body temperature it is possible to determine the current necessary to raise the temperature of the wire to any desired level. The current required to heat the wire to a given temperature is dependent then on two factors: (1) distribution of the wire within the sac and (2) cooling of the wire, which is dependent on the velocity of the blood flow. In order to keep the electrical requirements within 100 volts and to facilitate better distribution of the wire within the aneurysmal sac, we have elected to insert and heat the wire in segments of 33 feet (10 meters).

A 33 foot segment is wound equally on two aluminum spools. The center of the wire is bent sharply in a loop that will pass through a special needle (fig. 1). The wire is autoclaved and its insulation tested. A 1 cm. incision is made under local anesthesia. A self-retaining skin retractor (fig. 1) is inserted. Deep injections of procaine hydrochloride are made, and the special needle is inserted into the aneurysm. The two aluminum spools are now mounted on a special reel (fig. 2). The loop of wire in the center of the 33 foot segment is passed through the wire passer, which for the time is left unattached to the needle within the aneurysm, and then through the needle into the aneurysm 2 cm. beyond the end of the needle. The operator holds one wire and advances the other, thus forcing the formation of the first loop of wire within the sac. A few loops of wire are introduced in this manner. The special wire passer is now screwed into place on the aneurysm needle (fig. 2) and the rest of the 33 foot segment of wire quickly passed, two wires at a time. With the wire passer it is possible to introduce a 33 foot segment of wire in about four minutes.

As the wire is unwound from the spools the gears of the reel turn so as to rotate the spools in opposite directions (fig. 2). This gives the wire, on reaching the aneurysm, a torque to the right and to the left, serving to separate the wire and distribute the loops within the sac. The ends of the wire are bared of insulation and anchored to the electrode cap, which attaches to the end of the needle (fig. 1). A roentgenogram of the aneurysm is taken at this point to confirm the distribution of the wire. Insulation of the wire is again tested, and, if it is satisfactory, the wire is heated, usually to an average temperature of 80 C., for from five to thirty seconds. Patients without general anesthesia usually experience some discomfort (never severe) while the current is on. After the first heating of the wire, it is reheated, and the diminished current required to heat it to the same temperature is noted. The wire is now clipped flush with the needle and the ends pushed into the sac.

Since the rate of cooling is the factor determining the current necessary to heat the wire distributed within the aneurysm, a good index of the velocity of blood flow through the aneurysm is obtained. For example, it may require twice as much current to heat a segment of wire in one saccular aneurysm as to do so in another having a smaller mouth. It follows then that the higher the amperage required to heat the wire, the greater will be the number of 33 foot segments necessary to impede the blood flow.

From the experimental and clinical development of this principle, there has been evolved for wiring aneu-

3. The experimental development of this method and a detailed description of the technic have been omitted for the sake of brevity. This material will be the subject of a subsequent article.

rysms an accurate method having several practical aspects. On the basis of the number of amperes of current required to heat the first 33 foot segment of wire, well distributed within an aneurysm, to 80 C., it is possible to determine (1) the variety of aneurysm, (2) approximately the amount of wire that will be necessary to impede the blood flow and (3) the occurrence of complete mass clotting of the aneurysm if a final segment of wire requires only from 3 to 4 amperes for heating to 80 C.

A 33 foot segment of wire has a surface area of 8 square inches, which is increased to 16 square inches after the deposit of the protein coagulum. The magnitude of the impedance of blood flow necessary becomes further apparent when we add that the wire in the eleven cases we are reporting averaged 118 feet.

Former methods of wiring aneurysms afforded no index of blood velocity as a guide to wiring. Wire was recommended which, because of its large size and stiffness, could not be safely used in amounts sufficient

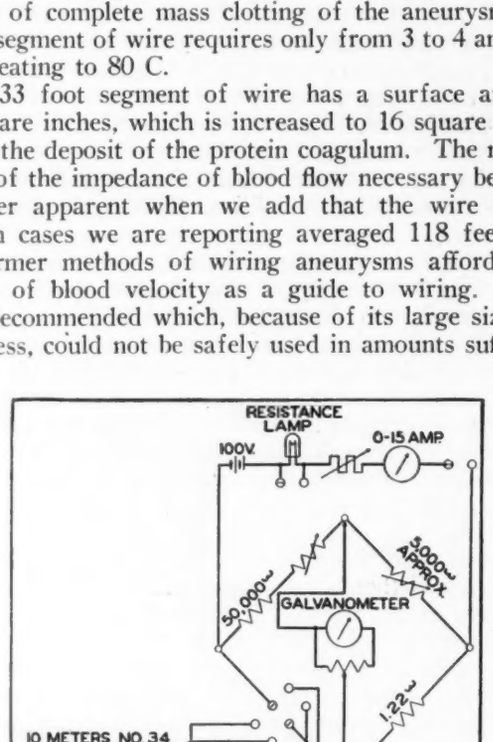

Fig. 5.—Apparatus for controlling the temperature of the wire.

to give more than a negligible impedance value. Finney,[4] for example, reporting twenty-one cases of wired aneurysms, wisely cautioned against the use of more than from 10 to 12 feet of wire in any case.

Adherence to the sac wall of a clot deposited within an aneurysm is imperative and its organization desirable. Whereas wire alone may reinforce the blood clot, heating to 80 C. wire distributed on the inside surface of an aneurysmal sac, as advocated by us, may cause inflammation in the sac wall.

Tissue subjected to a temperature of 80 C. for a few moments reacts within twenty-four hours with edema, vascular engorgement, dilatation and a typical inflammatory reaction on the part of the white corpuscles. The peak of the inflammation is reached in from four to six days. This is followed by a period of repair, in which fibroblasts appear and tissue organization takes place with the aid of a network of budding capillaries. The entire reaction occupies from ten to twelve days, without the appearance of tissue slough.

Experimental and clinical observations have convinced us that heat inflammation is an important factor in the inactivation of aneurysms. For this reason we repeat the wiring at from ten to fourteen day intervals for the more active aneurysms. This repetition has the added advantage of determining the progress of clotting.

An analysis of four cases in which there was a relatively short period of survival emphasizes the importance of complicating factors in the treatment.

CASE 1.—A Negro porter aged 29 was admitted June 24, 1934, complaining of cough, shortness of breath and pain in the upper left part of the chest. A diagnosis of saccular aneurysm of the distal transverse arch of the aorta, with perforation of the chest wall, was made. In spite of two long periods in the hospital during the ensuing year, the aneurysm grew and the symptoms became worse.

Jan. 2, 1935, 89 feet of wire was inserted into the aneurysm and heated in two stages. Symptomatic relief was immediate. Pulsation in the aneurysm diminished. Relief was maintained until the nineteenth postoperative day, when evidence of infection developed. The patient died of sepsis and secondary hemorrhage two weeks later. Necropsy showed a completely clotted saccular aneurysm with a small mouth. The position of the wire indicated absence of blood clot previous to operation.

Infection was due to accidental avulsion of the wound by the patient. The organism recovered was Staphylococcus albus. The wire was buried beneath the skin. In all subsequent cases the wire has been pushed entirely within the aneurysmal sac at the close of the operation.

CASE 2.—An excitable Mexican man aged 42 was admitted to Vanderbilt Clinic Sept. 30, 1932, complaining of cough and pain in the right side of the chest and a history of chancre and insufficient treatment fifteen years before. Examination revealed a fusiform aneurysm of the arch of the aorta, aortic insufficiency and high blood pressure. The Wassermann reaction was 4 plus. During four years of treatment the aneurysm became progressively larger. The heart, by electrocardiogram, showed progressive left preponderance and myocardial fibrosis. Symptoms of erosion of the chest afforded an indication for wiring. Sept. 26, 1936, operation was done in two stages. A total of 132 feet of wire was inserted into the aneurysm and heated. Relief of cough and pain was almost immediate.

December 12, three months postoperatively, there was no pain and no cough. Pulsation over the aneurysm was markedly diminished June 9, 1937, nine months postoperatively. The patient was working. There was no cough or pain. Roentgenkymograms showed little if any intrinsic pulsation of the aneurysm. June 27 the patient entered the hospital complaining of cough, fever and pain in the chest. A diagnosis of bronchopneumonia was made. Roentgenograms revealed no enlargement of the aneurysm since operation. However, an electrocardiogram showed an increase in the degree of damage to the heart muscle. The patient left the hospital after a few days and returned to work.

August 7 the patient was suddenly seized with an attack of precordial pain, and other symptoms were typical of coronary thrombosis. In spite of warnings he left the hospital and returned to work after two weeks. One week later he had another attack, from which he died in the hospital, several hours after admission.

By wiring, a 42 year old man having an inescapable triad of aneurysm, aortic insufficiency and hypertension was made symptom free for a period of eleven months.

CASE 3.—A Negro porter aged 50, admitted to the hospital Nov. 2, 1936, complaining of extreme shortness of breath and pain in the chest, had a history of chancre fifteen years before, treated by six injections. Ten months previous to admission he had knifelike pains in the sternal region. The Wassermann reaction was positive. He received, in all, fourteen injections of specific remedies. Three months before admission a pulsating mass appeared over the sternum and grew rapidly. Suddenly, three days before admission, the patient suffered excruciating pain and the mass became larger. Shortness of breath became extreme. On examination, the patient was

4. Finney, J. M. T.: Wiring of Otherwise Inoperable Aneurysms, Ann. Surg. 55: 661-681, 1912.

emaciated, markedly dyspneic and cyanotic, with dilated veins in the neck and over the abdomen. A large, actively pulsating aneurysm had perforated the sternum and lay just beneath the skin. The venous and spinal fluid pressures were 140 and 300 mm. of water respectively. The Wassermann reaction of the blood was 4 plus. A roentgenogram showed a huge aneurysm of the ascending arch.

Rupture of the aneurysm seemed imminent. November 14, 132 feet of wire was inserted into the aneurysm and heated. The patient died five hours later from respiratory failure.

This case well illustrates the danger of marked pressure on the vena cava. The cyanosis, dilated veins and extremely elevated venous and spinal fluid pressures confirm this. The use of tribromethanol in amylene hydrate and gas-oxygen anesthesia was a serious error in judgment. Local anesthesia is perhaps preferable in all cases of aneurysm but imperative in cases in which there is obstruction of the vena cava.

CASE 4.—A Negro man aged 46 had been known to have an aneurysm of the thoracic aorta for twenty years. On his admission to the hospital Jan. 30, 1932, a large aneurysm of the upper part of the thoracic aorta and a small aneurysm of the ascending arch of the aorta were noted. During the next five years the patient cooperated in his treatment; as dyspnea became worse he would cut down on activity. Several periods in the hospital for a long rest were efficient in controlling the pain and dyspnea. For a few months previous to admission on Feb. 8, 1937, in spite of the medical regimen, the patient's course had been consistently downhill. Pain in the aneurysm had become continuous. A feeling of extreme tightness in the chest had increased his dyspnea. The aneurysm had become larger and extremely sensitive to pressure. It pulsated violently and lay just beneath the skin. The aneurysm of the ascending arch remained the same size during the five year period and was found subsequently to be clotted. The heart was badly compressed between the two aneurysms.

With the patient's symptoms beyond control and rupture of the huge aneurysm imminent, wiring was begun February 13. A total of 132 feet of wire was inserted and heated in two stages. The relief of pain was almost immediate. March 10, one month postoperatively, the patient had gained 10 pounds (4.5 Kg.). He had no pain and could "sleep on the protruding aneurysm." His greatest relief was a "feeling of more room in his chest to breathe." May 12, three months after operation, there was no pain and no shortness of breath with ordinary activity. The aneurysm was smaller, pulsated less and was firmer.

The patient remained essentially symptom free until December, ten months postoperatively, when there was sudden onset of pain followed by a fairly rapid growth in the size of the aneurysm. December 13, 132 feet of wire was inserted into the aneurysm and heated. No improvement resulted. December 29, 48 feet of wire was inserted and heated. Thirty-six hours later the patient died suddenly after an outcry due to pain. At necropsy the left pleural cavity was filled with blood. The huge, protruding aneurysm was partly calcified. The calcium was fractured, but the exact point of rupture of the aneurysm could not be ascertained. The wire was well distributed in the outer and inner portions of the aneurysm. Clotting had taken place up to the mouth, which was huge, making the aneurysm partly fusiform and partly saccular.

The aneurysms in these four cases were about equal in size and very large. The small amount of current required to heat the wire in case 1 was indicative of slow-moving blood within the aneurysm, which predicated a saccular aneurysm with a small mouth. Such an aneurysm was found at necropsy. At operation a thorough needling of the aneurysm failed to return blood. This was considered indicative of complete clotting, which was verified at necropsy.

In case 1 only 89 feet of wire was required to cause mass clotting, whereas in case 3 132 feet of wire was required. Because of this and the higher amperage necessary to heat the wire, it was believed that, even though the aneurysms were of comparable size, the aneurysm in case 3 had a much larger mouth. In case 3, for example, it required 5 amperes to heat to 73 C. each of the first two 33 foot segments. The third segment required 4 amperes. The fourth 33 foot segment had so slowed the blood as to require only 3 amperes to heat, and, as expected, complete mass clotting took place.

The aneurysm in case 2 was considered fusiform, and it is of interest that the current requirement, 6.7 amperes, to heat the first 33 foot segment of wire was considerably higher than in cases 1 and 3, as might be expected for a very rapid blood flow. However, the fourth 33 foot segment of wire inserted slowed the flow to such an extent that it required only 4 amperes for heating. Sufficient mass clotting took place in this case to arrest the pulsation and inactivate the aneurysm.

Another type of aneurysm, that in case 4, received the same amount of wire, namely 132 feet, as did the aneurysm in cases 2 and 3, but after ten months began to grow. The blood velocity in this aneurysm was so great that even after the insertion of 132 feet of wire it required 6.3 amperes to heat the last 33 foot segment to only 61 C. We know now that complete mass clotting never takes place when blood moves rapidly; this was proved when exploration of the aneurysm ten months later revealed a large unclotted cavity. That the velocity of the blood was effectively reduced and clotting obtained by the subsequent addition of 180 feet of wire was shown at necropsy. These results suggest that if the entire 310 feet of wire had been inserted at the first operation the aneurysm might have remained inactive. Just what part, if any, fracture of the calcified wall played in the subsequent rupture is a matter of conjecture.

CASE 5.—A Negress aged 51, who entered the Vanderbilt Clinic March 30, 1931, eight years previously had received forty injections for syphilis. Her complaint was pain along the right side of the sternum and cough of several weeks' duration. Examination revealed a moderately active pulsating aneurysm of the ascending arch and a stricture of the rectum. The Wassermann reaction of the spinal fluid was positive. The patient was treated consistently from 1931 to 1935, during which time the aneurysm gradually grew. Because of beginning erosion of the chest, the development of throbbing pain, dyspnea and cough, and recurrent attacks of bronchitis, wiring became advisable. March 16, 1935, 53 feet of wire was inserted into the aneurysm and heated. A thorough exploration of the aneurysm with a needle at the close of the operation revealed it to be clotted. Relief of pain was complete after operation. May 4, two months postoperatively, there was no pain and no cough and the dyspnea was less. No pulsation was seen over the aneurysm. Feb. 15, 1936, eleven months postoperatively, there was no pain, no cough and no shortness of breath with normal activity. The aneurysm was needled and no free blood encountered. Twenty cc. of skiodan was injected into the aneurysm and remained there for days. Roentgenograms revealed the aneurysm to be smaller than before operation. April 8, 1938, three years postoperatively, the patient was symptom free and no pulsation was seen or felt. In August 1938, three years and five months postoperatively, she was symptom free and no change was seen in the aneurysm.

CASE 6.—A Negress aged 32, admitted to the hospital June 4, 1935, for two months had suffered from a throbbing pain to the right of the sternum and pain in the right scapular region. She suffered from cough, shortness of breath and night sweats. Fluoroscopic examination revealed a pulsating, fusiform aneurysm of the ascending arch. The heart was slightly enlarged; the Wassermann reaction was 4 plus. Moderately severe anemia was present.

Wiring of the aneurysm was begun September 17; 198 feet of wire was inserted and heated in three stages. Relief of pain and cough was prompt. Pulsation over the aneurysm became scarcely discernible. Shortness of breath improved, but anemia persisted. Sept. 30, 1936, one year postoperatively, the patient was operated on for a pelvic abscess. Her anemia and shortness of breath disappeared after convalescence from the pelvic peritonitis. Sept. 17, 1937, two years after wiring, no intrinsic pulsation could be demonstrated in the aneurysm either fluoroscopically or by roentgenkymogram. May 24, 1938, two years and eight months postoperatively, the aneurysm was inactive and the patient symptom free. In August 1938, two years and eleven months postoperatively, she was symptom free and leading a normal life.

This fusiform aneurysm, half the size of the saccular aneurysm in case 1, required double the amount of wire. Fortunately our method of heating affects only the wire within the sac. Wire crossing the fast, axial current of a fusiform aneurysm because of cooling remains uncoated by protein coagulum. To heat the first 10 meter segment of wire in case 6 to 73 C. required 7.5 amperes, whereas additional wire had so slowed the blood that only three amperes was necessary to heat the last 10 meter segment to 83 C. At the close of the operation concentric clotting had taken place to the extent of narrowing the channel available to blood flow to three-fourths inch.

CASE 7.—A West Indian laborer aged 37, admitted to Vanderbilt Clinic March 4, 1936, for two years had suffered pain in his back, mild at first but getting progressively worse. A roentgenogram revealed an aneurysm of the abdominal aorta, with marked erosion of the eleventh and twelfth dorsal and the first lumbar vertebrae. The Wassermann reaction was positive. During five months of antisyphilitic therapy the pain continued in the back in the region of the aneurysm. It became radicular and was only partly relieved by opiates. The patient was rapidly becoming bedridden; the muscles of the back were "frozen." Loss of weight and weakness progressed. Laparotomy Aug. 10, 1936, revealed a medium-sized saccular aneurysm arising from the posterior wall of the abdominal aorta, as indicated by roentgenogram. The special needle was inserted through the anterior wall of the aorta opposite the sac of the aneurysm and 33 feet of wire was introduced. Most of the wire accumulated in the mouth of the sac, which was unusually small. The patient's statement of immediate relief of pain was confirmed when he began to get around. The spasm in the muscles of the back began to disappear. Six weeks after operation the aneurysm was thoroughly explored with a 14 gage needle and found to be completely clotted. Feb. 6, 1937, six months postoperatively, the patient was back at work without a complaint and gaining weight. The back, of the ramrod type before operation, now has 100 per cent function in all directions. May 12, 1937, nine months postoperatively, roentgenograms revealed no further destruction of bone. The patient has gained 26 pounds (12 Kg.) since operation. August 25, twelve months postoperatively, a roentgenkymogram revealed no pulsation of the aneurysm. The patient worked regularly without symptoms. April 8, 1938, one year and eight months postoperatively, he was symptom free; there was no evidence of activity in the aneurysm. He was carrying on his job as truck driver's helper. In August, two years postoperatively, he was symptom free. There was no further erosion of the vertebrae. He continued his work loading trucks.

CASE 8.—A Negress aged 32, admitted to the hospital Oct. 7, 1935, for six months had been having pain in the upper left part of the chest, front and back. She suffered from dyspnea, cough and, more recently, hemoptysis and night sweats. Examination revealed a saccular aneurysm arising from the posterior wall at the distal one third of the transverse arch. The Wassermann reaction was positive. During the ensuing year rest and antisyphilitic therapy seemed to control most of the patient's symptoms. The aneurysm grew, however, and suddenly, in October 1936, the patient had a massive pulmonary hemorrhage, for which she was hospitalized. Within a month a second massive hemorrhage rendered her unconscious. From this time until her operation, Jan. 15, 1937, her course was rapidly downhill. There was pain requiring codeine for relief. Considerable hemoptysis occurred frequently during the day; dyspnea was distressing. The patient entered the hospital with cough and fever and in agonizing expectancy of a final gush of blood from her mouth. She was given transfusion, and a total of 165 feet of wire was inserted into the aneurysm and heated in two stages. A moderate pulmonary hemorrhage occurred after a coughing spell during the first operation. After wiring the pain quickly disappeared. Within three months she had gained 11 pounds (5 Kg.) and returned to work. Fourteen months postoperatively she informed us by letter that she continued to work, had gained 14 pounds (6.4 Kg.) and had no hemoptysis, cough or dyspnea. Rarely she has "slight pain in the aneurysm." In August, one and one-half years postoperatively, she had no pain, no shortness of breath, no cough and no hemoptysis; there was no change in the aneurysm, and she carried on her job operating a beauty parlor.

CASE 9.—A Negress aged 28 entered Vanderbilt Clinic March 23, 1936, complaining of difficulty in breathing of one and one-half years' duration, with cough, difficulty in swallowing and attacks of choking at night of five months' duration. She had been receiving antisyphilitic therapy elsewhere. Examination revealed a rather small aneurysm arising from the anterior wall of the distal third of the transverse arch. The aneurysm had paralyzed the left recurrent laryngeal nerve and compressed the left bronchus. During the next ten months pain developed along the left sternal border. The patient was admitted to the hospital May 2, 1937, with a bad cough, fever and marked stridor. Roentgenograms revealed almost complete occlusion of the left bronchus. May 15, wiring of the aneurysm was begun; 139 feet of wire was inserted and heated in two stages. One month after operation the patient was free from cough, there was no pain along the left sternal border and the dyspnea had vastly improved. A roentgenkymogram revealed a diminution in pulsation of the aneurysm. Three months after operation the patient went through a long siege of pelvic peritonitis, with fever and menorrhagia. Dizzy spells were an annoying feature of this illness. May 15, 1938, one year postoperatively, the patient was totally free from her original pain and was the picture of health. She was free from cough and dyspnea except when she had a cold or climbed stairs. There was still some wheezing, however, when she walked fast. In August, one year and three months postoperatively, her condition was unchanged.

CASE 10.—A Latvian laborer aged 68, admitted to the hospital Nov. 27, 1938, complaining of cramplike and throbbing pain in midabdomen, loss of weight and weakness of two months' duration, had a large pulsating aneurysm of the abdominal aorta, causing marked pressure on the duodenum. There was 30 per cent gastric retention. The Wassermann reaction was 4 plus.

At the end of a year's treatment the patient had, in addition to the crampy pain, a dull and throbbing pain over the aneurysm and lumbar pain so severe as to require codeine for relief. Duodenal obstruction became so marked that the patient, to avoid vomiting, took only fluids.

Dec. 30, 1937, 91 feet of wire was inserted into the aneurysm and heated. Ten days after operation the patient was eating a regular diet without a digestive symptom, and was totally free from pain. March 23, 1938, three months postoperatively, the patient had gained strength and 11 pounds (5 Kg.) in weight. He ate any food and was symptom free. The aneurysm seemed smaller and firmer and pulsated less. In August 1938, eight months postoperatively, he was symptom free and the aneurysm was unchanged.

CASE 11.—A Negro laborer aged 41 was admitted to the nose and throat department Nov. 17, 1937, moribund from tracheal obstruction. Examination revealed cyanosis, great respiratory stridor and pulmonary edema. A saccular aneurysm arising from the posterior wall of the aorta at the junction of the ascending and transverse arch caused almost complete occlusion of the trachea at the level of its bifurcation. Helium and oxygen, under pressure, relieved the patient's respiratory distress considerably. December 30, 109 feet of wire was

inserted into the aneurysm and heated. Three weeks later an additional 48 feet was inserted. Two weeks after operation the patient could assume any position without respiratory distress. March 8, 1938, three months postoperatively, he had gained 12 pounds (5.4 Kg.) and could walk slowly without dyspnea. April 27, four months postoperatively, he walked twenty-nine blocks and climbed stairs without shortness of breath. He was symptom free. A roentgenkymogram showed marked reduction of pulsation in the aneurysm. In August, eight months postoperatively, he was symptom free and had been working at his job as a truck driver for the past four months.

In spite of the fact that this man had mild hypertension, there was no evidence of aortic insufficiency and inactivation of his aneurysm may add years to his life.

In six of the seven living patients relief of symptoms has been complete. Patient 9, with almost complete occlusion of the left bronchus before operation, had slight dyspnea on climbing stairs one year and three months after operation.

The longest follow-up is three years and five months (case 5) and the shortest eight months. One fusiform aneurysm, in case 6, has been inactive for two years and eleven months. There are two patients with abdominal aneurysms: patient 7, with marked vertebral erosion, symptom free for two years, and patient 10, well eight months postoperatively. There are three aneurysms of the transverse arch with marked tracheobronchial pressure, in cases 10, 9 and 7.

Demonstration by roentgenograms of small changes in the size of the aneurysm after wiring is difficult. It seemed definite in case 5 (fig. 3). However, a reduction in size in case 7 made the difference between agonizing radicular pain and comfort. In case 8 it eliminated bronchial erosion and hemorrhage. In case 9 it averted death by strangulation.

Roentgenkymography has been of great help in showing the effect of induced clotting on the pulsation of aneurysm (fig. 4).

Whereas it is fair to assume in retrospect that rupture of the aneurysm in case 4 might have been avoided, the patient lived symptom free for more than ten months.

H. A. Christian,[5] in a review of forty cases of wired aneurysms, reported that ten of the patients (25 per cent) died of rupture within seven months after operation, eight of the ten dying within the first two months.

Sir D'Arcy Power [6] reported twenty-one cases, in seven of which (33 per cent) death from rupture occurred within two months after wiring.

CONCLUSION

We believe that a thoroughly clotted aneurysm may be inactivated indefinitely. Our method of clotting saccular and fusiform aneurysms, if used according to the technic described, is safe and efficient. Heating the wire to 80 C. causes a heat inflammation within the sac wall, which promotes adherence and organization of the clot deposited. We conclude that the absence of signs or symptoms of growth of the aneurysm in seven living patients operated on by this method and the relief of pain and symptoms due to distressing pressure justify us in recommending the procedure.

One Hundred and Sixty-Eighth Street and Broadway.

5. Christian, H. A.: Aneurysms of the Thoracic Aorta Treated by Wiring, Boston M. & S. J. **166:** 122-127 (Jan.) 1912.
6. Power, Sir D'Arcy: The Palliative Treatment of Aneurysms by "Wiring" with Colt's Apparatus, Brit. J. Surg. **9:** 27-36 (July) 1921.

BRONCHIAL ASTHMA

ITS DIAGNOSIS AND TREATMENT

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Through the evolution of the knowledge of allergy, especially in the last two decades, complete relief is often available for most patients suffering with bronchial asthma. At first the recognition of the role that inhalant allergy exerts in the disease was of great help. Then in the last decade the frequency of food allergy as a major and often a complicating cause and the relegation of bacterial allergy to its usual minor role have contributed most to improve our possible results.

An analysis of the results of the treatment of 1,443 private patients seen during the last fifteen years who have cooperated with at least fair satisfaction for six or more months is shown in table 1. Excellent or good results were obtained in approximately 80 per cent and fair results in 13 per cent. Poor results occurred in 7 per cent. Death occurred during attacks in six patients with long standing bronchial asthma. No morphine had been used except by one patient, who had taken it without order for some years. Death has also occurred, attributed largely to morphine, in two other cases, seen only in consultation. Such fatalities from chronic asthma emphasize continued study and treatment until satisfactory results are assured. In table 2 it is seen that favorable results are not greatly influenced by the duration of the disease. It is obvious that, if the cooperation had been better, these statistics would have been more satisfactory.

TABLE 1.—*Results with 1,443 Private Patients with Bronchial Asthma Who Have Given Fair Cooperation for at Least Six Months*

Results	0-15 Yrs. (469 Cases) Per Cent	16-55 Yrs. (783 Cases) Per Cent	55 and Up (191 Cases) Per Cent	1,443 Cases Per Cent
Poor	4	9	8	7
Fair	10	13	19	13
Good	27 } 86	26 } 78	33 } 73	27 } 80
Excellent	59 }	52 }	40 }	53 }

The procedures of diagnosis and treatment developed by many students of allergy since 1912 which I [1] have utilized will now be discussed.

A carefully recorded history taken with the possibility of all types of food, drug, inhalant, bacterial and parasitic allergy in mind is of the greatest importance. Rackemann [2] stated that the history is often of more importance than skin testing in diagnosis. Correlation of the symptoms with foods, medicines, seasons and environments is imperative. Thus asthma that is better in the summer and worse in the fall, winter and spring should suggest food allergy and, to a less extent, animal emanation, dust and other inhalant allergies encountered during these months. The history of recurrent asthma starting at the age of from 18 to 20 months, preceded frequently by infantile eczema, again points to

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1. Rowe, A. H.: Clinical Allergy: Manifestations, Diagnosis, and Treatment, Philadelphia, Lea & Febiger, 1937.
2. Rackemann, F. M.: History Taking in Allergic Diseases, J. A. M. A. **106:** 976 (March 21) 1936.

possible food sensitization. Increased asthma on week ends or on Mondays suggests overindulgence in foods or added inhalation of dusts or other allergens from home or social sources. Bacterial allergy must not be blamed merely because of true or apparent "colds," pneumonia or whooping cough before the original or recurrent attacks. Usually such "colds" are evidences of localized allergy rather than infection, the ensuing asthma resulting from an extension of such allergy to the lungs.

The systematic recording of the history expedites the diagnosis and may be recorded under the following headings:

1. Bronchial manifestations: Onset, frequency, periodicity and chronicity of the attacks or persistent symptoms, the amount and character of sputum, frequency and degree of cough, fever, complications and former history of bronchial symptoms.

2. Nasal and sinal symptoms: Duration, amount and degree of seasonal or perennial nasal congestion, blocking, sneezing, itching, nasal or postnasal discharge, sinal congestion or pain, and former history of head colds or sinusitis.

TABLE 2.—*Influence of Duration of Bronchial Asthma on the Results of Treatment in 873 Cases*

Years of Bronchial Asthma	Degree of Relief	Number of Patients		Per Cent of Patients
0 to 2	Poor	32		11
	Fair	54	280	19
	Good	61		22
	Excellent	133		48
3 to 7	Poor	20		7
	Fair	49	293	17
	Good	87		30
	Excellent	137		46
8 or more	Poor	27		8
	Fair	28	150	17
	Good	39		25
	Excellent	63		50

3. Dermatoses: Onset, duration and distribution of allergic dermatitis (eczema), contact dermatitis, urticaria or angioneurotic edema during life, with possible etiologic comment.

4. Gastrointestinal symptoms: Occurrence of canker sores and other oral, gastrointestinal and abdominal symptoms with their duration, degree, characteristics and possible relation to allergy.

5. Recurrent headaches, migraine, biliousness, fatigue or "toxic states."

6. Genito-urinary, cardiovascular, glandular, nervous or psychoneurotic disturbances, with data for or against allergy as a primary or complicating cause.

7. Dietary history: Dislikes or disagreements for foods of all types, and habits of eating. Questions such as Do you drink milk, eat eggs or spinach? may suggest allergy, digestive inefficiency, whims, fancies or psychoneuroses as causes. Potential or active nutritional deficiencies must be recognized, as emphasized by Minot.

8. Drug history: Possible allergy to medicaments used even infrequently.

9. Environmental history: The kind of carpet, curtain, furnishings, mattress, pillow, bedding, fur, clothing, animal, plant, flower, cosmetic, toilet accessories and other similar information concerning the living, sleeping, working and recreational environments; likewise the names of trees, shrubs and flowers, the character of the surrounding region, whether built up or in the country, its proximity to barns, animals, fields, orchards, forests or marshes, the amount and character of dusts and similar information.

10. Family history: Bronchial, nasal, cutaneous, gastrointestinal or other symptoms, especially migraine, recurrent headache, toxic or bilious states in several generations and progeny, with a record of possible familial ingestant inhalant or contact sensitizations. Other usual information concerning familial diseases, longevity and dietary habits.

11. Residences: Their possible relation to allergy.

12. Past history: Past or present infections or illnesses not already noted.

13. Menstrual history and the possible influence of allergy.

14. Operations: Year and results of operations, especially on the nose and throat.

15. Habits: Amount of tobacco and alcohol and their influence on allergy.

DIFFERENTIAL DIAGNOSIS

In the study of all symptoms of possible allergic origin it is most important to conduct a thorough physical examination and indicated laboratory studies to determine other possible causes. In possible bronchial asthma, one must have the various causes of dyspnea in mind.[3] Some of the important ones are pharyngeal abscess or tumor, laryngeal spasm (especially croup), laryngeal inflammation (acute and chronic), edema and stenosis, foreign bodies and neoplasms and paralysis of the vocal cords; tracheal and especially bronchial infection or inflammation (at times with stenosis), pulmonary atelectasis or pneumothorax, emphysema, neoplasm and at times bronchioliths or stones; external pressure from thyroid enlargements or carcinoma, thymus enlargements, aneurysm, enlarged or infected tracheobronchial nodes and mediastinal growths; pneumonia, tuberculosis of the lungs, pneumoconiosis, pulmonary fibrosis, cystic diseases of the lungs, pneumothorax and hydrothorax; cardiac decompensation, coronary sclerosis, auricular flutter or fibrillation, paroxysmal tachycardia, Ayerza's disease, coarctation of the aorta, renal sufficiency, acidosis, alkalosis or oxygen lack; functional and hysterical dyspnea, lesions of the respiratory center, and disturbances in the muscular function of the thorax and diaphragm.

When severe attacks of bronchial asthma or long standing recurrent symptoms with the typical hyperresonance, prolonged expiration with musical sibilant or coarse rales and rhonchi and varying degrees of wheezing are present, the diagnosis is quite assured; but when bronchitis is recurrent, associated with some wheezing and varying types of rales, inhalant or ingestant allergy may receive unwise emphasis. This occurred in one patient aged 65 whose symptoms were later relieved elsewhere by extraction of infected teeth and clearing of infection in the sinuses. Cystic disease of the lungs, pulmonary fibrosis, atelectasis, foreign bodies and emphysema have also caused symptoms suggesting bronchial asthma. However, the finding of obvious pathologic conditions which might explain asthmatic symptoms must not divert attention from possible ingestant or inhalant causes. Thus, in a boy aged 12 years who had had recurrent bronchial asthma for several years, remarkable diffuse calcified areas throughout both lungs were revealed by x-ray examination but his symptoms were entirely relieved by elimination diets. Also a woman aged 60 with elimination diets was relieved of long standing asthma, formerly attributed to marked pulmonary fibrosis.

X-ray studies may also reveal important pathologic changes in the thorax or lungs. With nasal symptoms a rhinologic examination is advisable. Opacity, cloud-

3. Maytum, C. K.: Differential Diagnosis of Asthma, M. Clin. North America 14: 729 (Nov.) 1930.

ing or mucosal thickening in the sinuses occurs more often from allergy than from infection.

The fact that long standing chronic asthma often leads to increasing emphysema and chronic bronchitis, and at times may result in bronchiectasis, in occasional atelectasis or in massive collapse of the lung (spontaneous pneumothorax), and not infrequently leads to death, stresses the importance of adequate study and control of all allergenic causes. The deformities of the chest, the retardation in growth and impaired nutrition which arise from uncontrolled asthma in childhood refute the assertion that the "child will outgrow his asthma."

TESTING FOR ALLERGY

All patients with possible bronchial asthma or allergic bronchitis should be tested with all food, animal emanation, dust, fungus and miscellaneous allergens, together with all tree, spring, summer, fall and cultivated flower pollens that might be ingested or inhaled. The results of the routine testing of 1,700 private patients are given in table 3. Testing must be done by one experienced in the technic of testing. Active allergens known to produce positive reactions in clinically sensitive patients must be used. Unquestioning dependence on such cutaneous tests rarely leads to good results, since cutaneous reactions are often negative to food and less often to inhalant allergens productive of clinical allergy. Moreover, nonspecific or irritant reactions occur, especially from intradermal testing with food allergens. Positive cutaneous reactions also may indicate only potential allergy. Therefore, positive cutaneous reactions are only guides to diagnosis, and their clinical importance must be checked by history, ingestion or inhalation.

As a routine, scratch testing should first be done with all allergens already noted. Thereafter, intradermal testing is advisable with 1:200 dilutions of all inhalant allergens of importance from the patient's point of view and to which negative scratch reactions have occurred. I have not used intradermal testing with food allergens as a routine for reasons previously stated.[4] Elimination diets are usually utilized for the additional study of possible food allergy. Because of varying skin reactivity, retesting at times in poorly controlled cases is necessary. With this plan of testing, the routine study can be completed in from one to three days, depending on the time that can be allotted by the physician. Such complete and rapid testing in infants and young children, however, must be varied according to the problem presented. For the details of technics, the type of allergens, syringes and needles used and the interpretation of the reactions, standard textbooks must be consulted.[5]

Because of the indefinite or negative cutaneous reactions that may arise, auxiliary methods for diagnosis have been developed.

1. Trial diets are of greatest importance in the diagnosis of food allergy. For this I continue to use my elimination diets [1] when I suspect food allergy which is not controlled with test-negative diets. In fact, when cutaneous tests are impossible the initial use of elimination diets is justifiable. Only with a trial diet used for several weeks or even months can food allergy be adequately studied. Trial diets will be used without results on many patients, but not as frequently as are other laboratory procedures. However, and this must be emphasized, if any nutritional deficiency or undesirable loss of weight arises from insufficient vitamin, protein or calory intake, such trial diets should be discontinued. Uncontrolled food allergy is preferable to the serious results of inadequate nutrition.

Though the choice and use of the elimination diets cannot be fully discussed, a few comments will be offered. Trial diets may be started with diets 1 and 2 combined, for which menus have been published.[1] If a history of probable idiosyncrasies to specific foods or groups of foods such as citrus fruits, the pit fruits or the legumes is obtained, or if definite scratch reactions have occurred to specific foods, they should be excluded, it being remembered, however, that only actual ingestion of such foods when the patient is symptom free can prove their allergenic activity. If positive cutaneous reactions or probable clinical symptoms are present to wheat or other cereals, trial diets may be started with cereal-free diet 3. In the use of the elimination diets, absolute cooperation is imperative.[6] Bread and bakery products must be made with ingredients of unquestioned purity, according to published recipes. Honest bakers must work under the direct supervision of the allergist. Foods eaten in restaurants, friends' homes and hotels must be free of every trace of ingredients not included in the diet. A taste or trace of a food may confuse the interpretation of results. The cooking of foods must be most particular. Food should not be stirred with a spoon that has touched milk or any other

TABLE 3.—*Results of Routine Cutaneous Testing in 1,700 Cases of Bronchial Asthma* *

	536 Cases: 0-5 (177) 6-10 (236) 11-15 (123) Per Cent	949 Cases: 16-35 (451) 36-55 (498) Per Cent	215 Cases: 55 Yrs. Up Per Cent	Total 1,700 Cases Per Cent
Positive family history....	67	50	54	60
Males.....	65	46	44	53
Females.....	25	54	56	47
Pollen sensitization:				
1+ reactions.....	27 } 54	18 } 59	18 } 41	22 } 52
2+ or 3+ reactions.....	27 }	41 }	23 }	30 }
Food sensitization:				
1+ reactions.....	30 } 48	20 } 38	20 } 33	23 } 40
2+ or 3+ reactions.....	18 }	18 }	13 }	17 }
Animal emanation sensitization:				
1+ reactions.....	32 } 50	23 } 46	20 } 37	24 } 44
2+ or 3+ reactions.....	18 }	23 }	17 }	20 }
House dust sensitization:				
1+ reactions.....	36 } 56	24 } 51	25 } 26	28 } 47
2+ or 3+ reactions.....	20 }	27 }	11 }	19 }
Orris sensitization:				
1+ reactions.....	4.9 } 6	6 } 9	3 } 5	5 } 7
2+ or 3+ reactions.....	1.1 }	3 }	2 }	2 }
Miscellaneous sensitizations:				
1+ reactions.....	10 } 14	10 } 18	3 } 5	8 } 14
2+ or 3+ reactions.....	4 }	8 }	2 }	6 }

* Scratch tests with food allergens; intradermal tests only with inhalant allergens which failed to react by the scratch method.

4. Rowe, A. H.: The Evaluation of Skin Reactions in Food Sensitive Patients, J. Allergy **5**: 135 (Jan.) 1934.
5. Tuft, L.: Clinical Allergy, Philadelphia, W. B. Saunders Company, 1937. Bray, G. W.: Recent Advances in Allergy, Philadelphia, P. Blakiston's Son & Co., 1937. Vaughan, W. T.: New book, to be published. Hansel, F. K.: Allergy of the Nose and Paranasal Sinuses, St. Louis, C. V. Mosby Company, 1936. Rowe.[1]

6. Rowe, A. H.: The Dietary Problem of the Food Sensitive Patient, Am. J. Digest. Dis. & Nutrition **4**: 787 (Feb.) 1938.

forbidden food before it has been washed. Similar care of cooking utensils, knives and dishes must be observed.

If relief is not evidenced in two or three weeks, another elimination diet should be tried, provided proper weight and nutrition are maintained. Finally, if food allergy is likely and the routine diets have failed, the use of my supplemental diets [1] which exclude groups of foods such as vegetables, fruits, meats or cereals may be used, but never if nutritional damage is likely. If milk is excluded for more than two weeks, especially in infancy, extra calcium should be ordered. When sunshine or quartz light is not available, viosterol in an oil included in the diet should be prescribed. The exclusion of important foods such as milk, egg or wheat should never continue for more than a few weeks unless clinical testing with such foods demonstrates resultant symptoms from them. Above all else, the patient must be interviewed every few days to determine any dietary mistakes and to prescribe indicated additions or changes.

2. For the study of food allergy, the leukopenic index as described by Vaughan [7] and recommended by Rinkel, Gay, Squires and others has been advised. In my practice, since this test is time consuming and subject to technical error, and because of the necessity of using trial diets to confirm the clinical significance of a positive index, it has been used only in a few selected cases.

3. Diet diaries may yield important information, though the careful questioning about possible mistakes in dieting or concerning reactions from foods usually makes such diaries unnecessary.

4. Negative cutaneous reactions to pollens and other inhalants productive of clinical allergy may occur, possibly in from 10 to 20 per cent of such sensitizations. Lack of skin-sensitizing bodies is responsible, though such bodies are usually present in the mucous membranes of the eyes, nose or bronchi. Hence the ocular, nasal or intrabronchial tests with the dry allergens or their extracts are used to obtain more specific information about inhalant allergens suspected through history. The technic of such tests is described in current textbooks.

5. The passive transfer, or Prausnitz-Küstner reaction, at times will reveal positive cutaneous reactions not obtainable in the patient. Cowie [8] reports increased skin reactivity in the actual patient when the tested areas have been injected twenty-four hours previously with autogenous serum. The practical value of these tests is restricted and usually must be utilized by specialists in selected cases.

6. Environmental control that eliminates practically all air-borne allergens is of value in the study and treatment of suspected inhalant allergies. When house dust, animal emanation and other miscellaneous sensitizations are present, the covering of pillows and the mattress with dust-proof covers, the use of washable cotton blankets, the removal of overstuffed furniture, the use of washable curtains and rugs and the thorough wiping of ceilings, walls, floors and all furniture and other surfaces so that all dust is eradicated will often yield desired information. If pollens and other outdoor inhalants are suspected, a pollen filter which throws inhalant-free air into the room is frequently necessary. If money is available, an air conditioning unit which not only filters but controls the temperature of the air is desirable. Relief occurring in a few days favors inhalant allergy. Such an environment may be necessary until specific desensitization offers adequate protection.

7. The final diagnosis of the allergenic causes of bronchial asthma must depend on the results of treatment. Thereby it is gradually determined what foods or other ingestants cause the symptoms and what inhalants must be avoided or must be included in antigens for hyposensitization therapy. Likewise, the less frequent role of bacterial allergy can be determined only after the results of vaccine therapy and removal of foci have been noted. At times the many specific causes of bronchial asthma remain in doubt for months and, as good or excellent relief occurs, such etiology may never be incontrovertably proved.

TREATMENT

Treatment is best considered under the following headings:

1. Inhalant sensitizations to certain pollens, animal or insect emanations, dusts and miscellaneous allergens at times may be controlled by their elimination from the patient's environment. Usually, however, hyposensitization with etiologic allergens is necessary. Specific therapy with individual grasses, feathers or other allergens is usually required. Moreover, the autogenous house or other dust extract is to be chosen in place of stock preparations. The initial dose of an antigen should be 0.05 or 0.1 cc. of a dilution which fails to react by the scratch method. Such a dilution is usually a 1:5,000 or a 1:50,000 dilution, though at times, as in some allergies to silk or glue, the dilution for the initial treatment may have to be as dilute as one to five or even to five hundred million. The method of increasing the doses, the maximum amounts indicated, the duration of therapy and other considerations concerning hyposensitization treatment must be obtained from current publications.[8a] In general, treatment must not increase or reestablish allergic symptoms, especially during pollen seasons, when coseasonal therapy with small doses of a 1:50,000 or 1:5,000 dilution given every one or possibly two days is usually very beneficial. In the absence of definite symptoms, maximum doses of from 0.5 to 1.0 cc. of a 1:50 dilution can gradually be reached and repeated every one to two weeks for perennial therapy. The duration of such treatment must vary with the patient's allergy and the persistence of the established hyposensitization. The prompt control of general reactions with from 0.3 to 0.8 cc. of a 1:1,000 solution of epinephrine hypodermically must be stressed. This dose should be repeated every five to thirty minutes until symptoms are well controlled. A tourniquet placed above the site of injection, loosened every five minutes for one minute over a period of twenty or thirty minutes, retards antigen absorption.

When sensitization is present to animal emanations, dusts and other inhalants in the living or working environment, elimination of such inhalants is often necessary. Such environmental control, at least until hyposensitization has been achieved, is necessary. During the pollen season, pollen filters or air conditioners may also be necessary until protection is afforded by proper therapy. In the patient sensitive to house dust the amount of necessary environmental control varies with the patient's susceptibility and the results of house dust therapy.

7. Vaughan, W. T.: Leukopenic Index as a Diagnostic Method in the Study of Food Allergy, J. Lab. & Clin. Med. **21**: 1278 (Sept.) 1936.

8. Cowie, D. M.: Autopassive Transfer in Allergy, Ann. Int. Med. **11**: 949 (Dec.) 1937.

8a. Rowe.[1] Tuft.[5] Vaughan.[5]

With uncontrolled patients, attention must be directed to possible fungus allergy,[9] which seems more frequent than has been appreciated, and also to the action of unusual or unsuspected inhalant allergens, the discovery of which may require a special study of the home or outdoor environment.

2. Food sensitizations are best controlled by the continued elimination of the causative foods. Increased tolerance may arise in a few weeks, but usually months and at times years are necessary. The use of denaturized foods such as evaporated milk may be effective in certain mildly sensitive patients but fails when marked allergy is present. The possibility of increasing tolerance by the hypodermic administration of food allergens or by the gradual feeding of such foods must be kept in mind, though in the hands of most allergists this has not been especially successful. As already stressed, the longer continued elimination of foods is justified only when a diet containing proper proteins, vitamins, minerals and calories is possible which meets all nutritional requirements and maintains a satisfactory weight.

Other ingestants such as drugs, minerals including chlorine and calcium, and organic or other substances in water to which allergy occasionally arises must be excluded for relief.

3. My opinion coincides with that of most allergists that bacterial allergy is much less frequent, especially as a major cause of bronchial asthma, than seemed likely two decades ago. Thus, an exhaustive study of the possibilities of inhalant and ingestant allergies must be made before much stress is placed on bacterial sensitizations. However, in cases resistant to such effort, bacterial allergy should be studied. Foci of infection, especially in the gums, around the teeth and in the sinuses, rectum and even gallbladder and appendix must be suspected. Surgery alone, however, on the nose and throat rarely benefits patients with asthma[10] and is indicated only to remove definite nasal infection or obstructions when underlying allergies are under control.

Autogenous vaccines may be prepared not only from such foci but also from the sputum. Harley[11] recently confirmed the skepticism of others as to the value of immediate or delayed cutaneous tests as indicators of causative bacterial allergens. He advised the initiation of vaccine therapy with doses of not more than one million subcutaneously, the dose being gradually and cautiously increased every five to seven days according to the relief obtained. Continued administration of such vaccine every one to three weeks for a year or more may be advisable. A stock respiratory vaccine may be as effective as an autogenous one. In a few cases I have used such vaccine by vein in a suspension of one million to the cubic centimeter. Of this, from 0.05 to 0.1 cc. has been given every four to seven days with a gradual slight increase according to the results, with excellent benefit in a few isolated cases. Whether the effect is due to specific or to nonspecific action is difficult to determine.

4. As for general therapy, (*a*) The hypodermic administration of a 1 : 1,000 solution of epinephrine continues to offer the best relief to bronchial asthma. In doses of from 3 to 12 minims (0.2 to 0.8 cc.) according to the age and severity of the symptoms, such treatment can be repeated every five to thirty minutes as necessary for relief. Its effect is enhanced at times if given slowly. Intravascular injection must be prevented. In recurrent asthma, self administration is justified.

The inhalation of a 1 : 100 solution of epinephrine[12] has decreased the necessity of the subcutaneous injection of a 1 : 1,000 dilution for the relief of moderate symptoms. Potent preparations in vaporizers throwing off a good volume of vapor must be assured.

(*b*) Ephedrine sulfate in doses of from three-eighths to three-fourths grain (0.02 to 0.05 Gm.) by mouth relieves some patients. The nervousness resulting from this drug is reduced by its combination with various barbiturates. In combination with a theobromine and a barbiturate the effectiveness at times is increased.

(*c*) Iodides maintain their long recognized value in bronchial asthma. The saturated solution of potassium or sodium iodide in doses of from 5 to 20 drops two to four times a day according to the age and the type of asthma is generally used. Its combination with tincture of stramonium or lobelia or with ipecac or apomorphine enhances the relief in some cases. With its use the occurrence of marked nasal congestion, headache, swelling of the salivary glands and acneform lesions of the skin may contraindicate its continuance.

(*d*) Morphine is contraindicated for the relief of bronchial asthma. Repeated epinephrine therapy will control practically all attacks until the treatment based on specific inhalant or ingestant causes produces results. In severe intractable asthma, morphine even in small doses may decrease voluntary breathing, leading to asphyxia and not infrequently to death.

(*e*) The decrease and expulsion of bronchial mucus is of great importance for the relief of bronchial asthma. For this, iodide and at times ipecac therapy are most helpful. In intractable asthma which does not yield to the control of possible ingestant, inhalant or bacterial sensitizations, mild etherization, usually by rectum,[13] may produce bronchial relaxation, with subsequent mucoid expectoration. When adherent mucus, bronchial casts or other bronchial obstructions are suspected as causes of resistant asthma, bronchoscopy may be of value.

Recently the intrabronchial instillation of iodized oil[14] has been advised in most cases of resistant asthma. When retained mucus may be exaggerating the symptoms, such oil may be required, though, with proper treatment directed against existing allergenic causes, the asthmatic symptoms are usually so well controlled that the bronchial mucus is gradually expectorated. Moreover, the necessity of repeated instillations of iodized oil usually indicates that undiscovered or uncontrolled allergies demand further study and treatment.

(*f*) The intravenous administration of neoarsphenamine exerts spectacular relief in a few cases of severe bronchial asthma. It is especially indicated when a greenish abundant sputum containing spirochetes is present, but the drug in certain cases seems to exert a nonspecific effect apart from its bactericidal action. Beneficial effects from the intravenous administration of calcium gluconate or calcium chloride have not been

9. Feinberg, S. M.: Seasonal Hay Fever and Asthma Due to Molds, J. A. M. A. **107**: 1861 (Dec. 5) 1936. Brown, G. T.: Hypersensitiveness to Fungi, J. Allergy **7**: 455 (July) 1936.
10. Piness, George, and Miller, Hyman: Allergy, Nonsurgical Disease of Nose and Throat, J. A. M. A. **85**: 339 (Aug.) 1925.
11. Harley, David: Asthma, with Special Reference to Vaccine Therapy, Lancet **2**: 367 (Aug. 15) 1936.
12. Graeser, J. B., and Rowe, A. H.: Inhalation of Epinephrine for the Relief of Asthmatic Symptoms, J. Allergy **6**: 415 (July) 1935.
13. Maytum, C. K.: Bronchial Asthma: Relief of Prolonged Attack by Colonic Administration of Ether, M. Clin. North America **15**: 201 (July) 1930.
14. Balyeat, R. M.; Seyler, L. E., and Shoemaker, H. A.: The Diagnostic and Therapeutic Value of the Intratracheal Use of Iodized Oil in Cases of Intractable Asthma, Radiology **24**: 303 (March) 1935.

evident in my work. In severe asthma the intravenous use of sodium iodide may be of temporary help. Its use should always be preceded by oral administration to rule out a possible allergy thereto.

(*g*) The fact that bronchial asthma may disappear or decrease during certain infections has led to the use of fever therapy with varying benefit. In resistant asthma, such fever may be induced by intravenous injections of typhoid bacilli or by heat therapy. I have resorted to such therapy in a very few cases. The benefit of roentgen therapy is uncertain and should never supplant the therapeutic recommendations as outlined in this paper.

(*h*) Breathing and other exercises as developed especially in England [15] are of value when deformities or underdevelopment of the chest and its musculature have arisen from chronic asthma. With the control of such asthma, however, with therapy based on existing allergies, indications for these exercises decrease.

(*i*) A warm dry climate, especially in high altitudes, seems to decrease allergic reactions to foods and also to certain inhalants, but with proper recognition and control of allergenic causes such climatic change is unnecessary. The idea of curing asthma by climate is futile and often leads to financial ruin.

(*j*) Intractable asthma becomes less frequent with proper diagnosis and treatment. However, until allergenic causes are controlled and mucus is expectorated, an emergency may exist. Such severe cases should be hospitalized in environmentally controlled rooms, foods on elimination diet should be given and immediate attention should be paid to other possible allergenic factors. The frequent use of epinephrine hypodermically is most necessary. Dehydration often exists, increasing the inspissation of bronchial mucus. Benefit, therefore, may arise from intravenous saline and dextrose therapy. The contraindication for morphine and other sedatives has been noted. If the circulation will permit, induced vomiting by ipecac or apomorphine hydrochloride may aid in the expulsion of bronchial mucus. Theophylline with ethylènediamine,[16] 7½ grains (0.5 Gm.) in 10 cc. by vein, may give rapid relief in cases resistant to epinephrine. Kahn [17] also recommended the slow administration by vein of from 1 to 3 minims (0.06 to 0.2 cc.) of a 1:1,000 solution of epinephrine. Oxygen therapy or helium and oxygen [18] may be advisable. In selected cases anesthesia with ether in oil by rectum [13] has been a life saving measure.

(*k*) Rest as in other chronic diseases must be utilized in many cases, according to the patient's problem. Circulatory exhaustion and mental and physical fatigue thereby are benefited. It is best carried out in a hospital or sanatorium, though, if the necessary dietary and environmental control can be provided, financial considerations may require such rest at home.

(*l*) Of greatest importance is the unquestioned cooperation of the patient over a long period. Relief may occur rapidly, but diet control and hyposensitization often must be continued for months and frequently for years if lasting results without further treatment are to occur.

15. Bray.[5]
16. Hermann, George, and Aynesworth, M. B.: Successful Treatment of Persistent Extreme Dyspneic "Status Asthmaticus": Use of Theophylline with Ethylene Diamine U. S. P. (Aminophyllin) Intravenously, J. Lab. & Clin. Med. **23**: 135 (Nov.) 1937.
17. Kahn, I. S.: The Intravenous Use of Epinephrine in Severe Bronchial Asthma, Ann. Int. Med. **3**: 1140 (May) 1930.
18. Barach, A. L.: The Therapeutic Use of Helium, J. A. M. A. **107**: 1273 (Oct. 17) 1936.

CONCLUSIONS

1. Excellent or good relief has resulted from available diagnosis and treatment in approximately 80 per cent of patients suffering with bronchial asthma. Inhalant and food allergies are the usual causes, bacterial allergy being of minor importance.

2. Carefully recorded histories often suggest the allergic etiology. Moreover, the causes of wheezing other than bronchial asthma must be remembered.

3. Positive cutaneous reactions must be checked by history and clinical trial. Often they are of potential or nonspecific significance.

4. Because of negative cutaneous reactions not only to food but also to inhalant allergens, supplemental methods of diagnosis must be used, such as trial diets, diet diary, leukopenic index, ocular or nasal tests and environmental control.

5. Elimination diets for the study of possible food allergy require absolute cooperation and assured protection of nutrition and of optimal weight.

6. Treatment of inhalant allergy necessitates hyposensitization with proper antigens and environmental control according to the problem.

7. Food allergy demands elimination of the allergenic foods until tolerance returns. Hyposensitization with food allergens is not generally successful.

8. For relief of symptoms the iodides, epinephrine by hypodermic injection or inhalation, ephedrine by mouth and intrabronchial iodized oil in selected cases are of greatest value. Nasal surgery for removal of obstructions and actual infection should be done only after careful study and control of causative allergies.

9. Intractable or severe asthma requires the use of environmental control and elimination diets, while other indicated procedures such as intravenous saline solution and dextrose, repeated hypodermic injection of epinephrine and possibly oxygen, helium and oxygen therapy or other measures are being utilized. Theophylline with ethylenediamine by vein may give relief in cases resistant to epinephrine. As in all bronchial asthma, morphine is contraindicated.

10. Finally, for lasting satisfactory results, continued study, treatment and cooperation are demanded for months and often for several years until all allergenic and secondary causes of bronchial asthma are recognized and controlled.

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ABSTRACT OF DISCUSSION

DR. CHARLES H. EYERMANN, St. Louis: We have heard an excellent summary of the methods of therapeusis and of diagnosis applicable to bronchial asthma, an affliction which in the past forty years has emerged from the welter of neurosis as a disease based on allergy. The experiences of other physicians with these methods would most likely agree when the relevant fundamental principles are involved, but, owing to the comparative youth of the concept of allergy and to the difficulties of the clinical problem, there will be differences of opinion as to the details of their application as well as to the interpretation of results. The utility of the diagnostic and therapeutic measures enumerated by Dr. Rowe in general depends on one's personal clinical judgment. Because of the practical implication, bacterial allergy as a cause per se of bronchial asthma is a moot question. My experience agrees with that of Dr. Rowe in that the absorption of bacteria or their products as a cause of allergic asthma is a rare clinical entity. That patients will wheeze from secretory obstruction of the tracheobronchial tree from which bacteria can be cultivated is undeniable, but that is not allergic asthma. That the absorption of bacteria or their products may produce bronchial edema or spasm is contro-

versial both experimentally and clinically and as far as my experience is concerned is a rarity, attested by the infrequency with which bronchospasm follows the parenteral injection of bacterial vaccines. The combined good and excellent results are gratifying and merit commendation but provoke comment. In view of the fact that 86 per cent of good and excellent results are obtained in the age group 0 to 15 years and that males are likely to lose their asthma at puberty, it is pertinent to inquire the percentage of males in this age group. It is also important to know how much less asthma one must have in order to obtain a good or excellent result. These words connote a personal standard and will not be interpreted by all observers in the same manner. To express the results of treatment, it has seemed simpler to compare the number of asthmatic episodes during and following specific treatment with those without or before specific treatment was instituted. Remissions for five years and longer are not infrequent. Such a period of freedom from asthmatic episodes would be my interpretation of an excellent result. Clinical studies like this one of Dr. Rowe's will aid in the eventual simplification of a complex clinical problem.

DR. GEORGE PINESS, Los Angeles: The question of food sensitivity as discussed by Dr. Rowe appears to be the major factor in the production of allergic diseases, particularly bronchial asthma. As a matter of fact, in a study of several thousand individuals who were studied physically, by laboratory, roentgenologically and from an allergic standpoint, only 1 per cent were sensitive to foods and foods alone. This was not limited to any particular age group. Seventy per cent were multiple sensitive, foods being one of the factors involved. On the other hand, Dr. Rowe in his own statistical studies reveals a sensitivity of 40 per cent of his individuals to pollen and another 40 per cent sensitive to inhalant or epidermal or environmental types of allergens. The fact is that multiple sensitivity is a rule, and food sensitivity may be a part of it and may be a factor in the production of bronchial asthma but does not occur as frequently as Dr. Rowe would lead us to believe. The question of the comparative value of skin testing with trial diet brings up a controversy that occurs at every meeting. It is my opinion that, if cutaneous testing is done on a sensitive individual with active proteins or allergens, positive skin reactions will be obtained and generally clinical proof of this sensitivity is obtainable. That the percentage of positive reactions in many individuals is great does not preclude their specificity. The positive reaction always indicates an at least potential possibility of its being a cause of the allergy. However, it takes more than cutaneous testing to diagnose and cure allergic individuals and in my opinion cutaneous testing is not a means to an end to make a diagnosis but merely to determine cause after that diagnosis of allergy has been made. It takes skill and intelligence to make an analysis of the problem, and when the clinical history is corroborated by cutaneous testing there is some value to the tests; but merely to use it to advise individuals of their sensitivity to this or that and have them eliminate these items from the diet or environment does not give a patient anything of value and throws a perfectly good work out of repute. The trial diet question is not a new one, and it has always been my belief that the patient's guess is much better than the doctor's. When one takes a diet of twenty or more foods, it is very difficult for the clinician to guess which food might be a factor. Not alone that but there are many other factors that are important. One cannot determine clinical sensitivity in an hour or in several hours or sometimes in a month, because the patient's limit of tolerance is something for which no yardstick exists.

DR. JOHN FRANCIS QUINLAN, San Francisco: Some aspects of asthma are comparable to the degenerative diseases. Physiologically it is a spasm of the bronchioles which, like the intestine and the vascular system, are encircled by smooth muscle. Spasm is merely a sustained anaerobic phase of contraction in the cycle of muscular activity. Allergens are characterized by the benzene ring; plant tissues contain the phytosterols; animal tissues, including hair and feathers, cholesterol; and dusts, both. Proteoses contain amino acids, which have the benzene ring as their nucleus. Coal and oil, the basis of many medicaments, are the lipoid residue of prehistoric vegetations. Asthmatic patients are emotionally unstable. Emotional instability is accompanied by a faulty dextrose metabolism. Dextrose, which relieves asthmatic patients, is essential in the aerobic phase of muscular relaxation. Adrenal cortex extract, controlling the retention of sodium in the body, determines consequentially the hydration of the tissues and the disposition of dextrose and the other electrolytes. An increase of potassium, a result of dehydration, is characterized by spasticity. Precancerous tissue, being deficient in glycogen, does not stain with iodine. Senile vaginal tissue is deficient in glycogen. Senile vaginitis is curable by the gonadal extracts, which means that they are involved in the fixation or condensation or polymerization of dextrose in the tissues. Hypertension, claudication, angina pectoris equivalents for vascular spasm, and asthma are aided by gonadal extracts, which means that they are involved with dextrose in muscular relaxation. Sterols, conjugations of the benzene ring and the mother substances of the gonadal and cortical extracts are comparable to the glucosides of digitalis and strophanthus. The adrenal cortex and gonads are concerned with the dynamism of the body. The gonads are considered endocrine glands, though their glandular structures are continuous with their excretory ducts, the apparent separation of the ovary serving the purpose of conservation of the dynamic factors in the follicular fluid, which is discharged into and resorbed from the abdominal cavity as the ovum is extruded into the oviduct. The excretions of the testes are physiologically released in the orgasm at intercourse. They stimulate, through absorption from the vagina, follicular development and supply chemicals which are essential for the maintainance of a woman's emotional composure and physical energy. Any interference with their normal deposition in the vagina directly conditions the emotional state, which, depending on the woman's basic character, determines the development not only of asthma but also, more remotely, of a degenerative disease.

DR. JULIAN COHN, Los Angeles: I should like to discuss a better classification of allergy in its relation to everyday life. Drs. Coca and Cooke in 1922 and again in 1934 discussed allergy in two different forms. The first, the normal allergies, such as hypersensitiveness of infection which anybody may acquire, and abnormal forms, such as bronchial asthma, hay fever and related conditions, are based mainly on inheritance. If these two forms are understood, a better understanding will prevail. A review of the literature of those reporting relief of asthma in their series has shown that all the cases belong in four groups. For instance, 25 per cent are practically cured, 25 per cent obtain moderate to great relief, 25 per cent obtain slight relief and 25 per cent obtain no relief. I would emphasize from the point of view of the allergist that scratch testing elicits a small percentage of positive tests. To get any type of reaction at all, patients must be very sensitive. The intracutaneous method of testing is the only adequate method. The number of diagnoses of pollen asthma cases may be materially increased if the work of Peshkin is followed. He instilled a small amount of dry pollen in the conjunctival sac. It serves to prove the diagnosis obtained by cutaneous testing. If this is done, more cases will be diagnosed than are diagnosed now. To illustrate, a young man came to Los Angeles and contracted asthma. He went to an Eastern clinic, was tested and told to forget it. He returned to Los Angeles. In testing him I could find no causative factor. The ophthalmic test with the pollen was done and reactions to grasses and weeds were obtained. Therapy was effective. As Dr. Rowe said, morphine is really contraindicated in severe asthma, but occasionally one will find a case in which one has to use it. Negativistic attitudes of physicians who speak of poor results should be dispelled. There is no justification for it. Climatic change may do good in some but not in a large number of cases.

DR. ALBERT H. ROWE, Oakland, Calif.: Dr. Eyermann's opinion that bacterial allergy infrequently is a major cause of bronchial asthma confirms the general conclusion. I agree, moreover, that occasionally wheezing and other symptoms suggestive of bronchial asthma may arise from bronchial infection alone and not from sensitization to the causative bacteria. Dr. Eyermann was correct in stating that conclusions drawn from my statistics could vary according to the manner of their analysis. However, as presented, they demonstrate without question

that excellent or satisfactory relief is available for the large majority of patients suffering with bronchial asthma, provided the methods of diagnosis and treatment available today as presented in this paper are properly utilized. Dr. Piness questions the use of trial diets again. My continued experience during the last fifteen years demonstrates that the use of such diets, especially the elimination diets, as a diagnostic measure reveals much food allergy that otherwise is difficult to recognize. Adequate amounts of protein, vitamins and calories must be insisted on when such diets are used, absolute cooperation and accuracy on the patient's part must be had, and under no circumstances should elimination diets be continued if nutritional damage or undesirable loss of weight cannot be prevented. My experience has repeatedly indicated that scratch tests with food allergens fail to reveal many foods to which allergy exists and that intradermal testing with such foods may give reactions which are not indicative of clinical sensitization and also may fail to reveal certain foods productive of low grade or chronic allergic disturbances. Thus diet trial modified as discussed in my paper seems necessary for adequate study of many patients suspected of food allergy. My statistics demonstrate that inhalant allergy has received as much consideration in my treatment as has food allergy, if not more. They also show that multiple sensitization to foods and inhalants is the rule, though a definite number of patients suffer with asthma from food or inhalant allergy alone. Dr. Cohn's warning about the intradermal test is important. Too many deaths have occurred from its initial use without preliminary scratch tests. His mention of the ocular test is valuable and serves to emphasize the fact that the cutaneous test may be negative not only to foods but also to inhalant allergens in certain cases.

SUPERVOLTAGE ROENTGEN TREATMENT OF CARCINOMA OF THE BLADDER

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The percentage of cures of advanced malignant disease by any of the therapeutic methods now in use is not high. This applies to new growths which are superficially located as well as to those which occur in the deeper tissues.

Recently a large number of cases of cancer of the skin was reviewed by one of us [1] with a view to determining the results of therapy, both surgical and radiologic, in relation to the size of the lesion. It was found that those epitheliomas which did not exceed 1 cm. in diameter showed 95 per cent cures by either irradiation or surgery. However, when the growth exceeded 2.5 cm. in diameter this figure fell to 50 per cent.

Advanced deep-seated carcinoma which is inaccessible and must be irradiated through a large volume of normal tissue may be expected to show even a less satisfactory response. Any method of treatment which holds some promise of cure of a small percentage of deep-seated new growths and which will cause regression, at least temporarily, with symptomatic relief in a larger percentage is worthy of consideration.

At the June 1937 meeting of the American Association of Genito-Urinary Surgeons a paper on the high voltage roentgen therapy of malignant tumors of the urinary bladder was presented.[2] The results in twenty-four cases treated by the usual 200 kilovolt roentgen rays were set forth in this communication. There were only seven patients in this group whose therapeutic program was limited to external irradiation alone. Of these, five had growths classed as inoperable and one, although the growth was operable, refused surgery. Of the two favorable cases in this small group, one showed complete disappearance of two small papillary tumors near the orifice of the left ureter following 200 kilovolt irradiation through four portals, the dosage being pushed to the limit of skin tolerance. In the second case some regression was obtained of a moderately large papillary tumor involving the left lateral wall and trigon of the bladder. In an occasional case in the more advanced group it was felt that the amount of regression following external irradiation had been sufficient to place the patient more definitely in the operable class. The conclusions drawn from this study were as follows:

> It is our belief that external irradiation with 200 kilovolt equipment by ordinary methods and with ordinary dosage has no place as a curative agent in the routine treatment of malignant tumors of the urinary bladder. As a palliative agent it will prove useful, especially in the arrest of hemorrhage, and in an occasional case sufficient regression may be accomplished to render an extensive lesion more amenable to cure by other means.

At the time of preparation of the manuscript on 200 kilovolt roentgen irradiation of carcinoma of the bladder, a supervoltage roentgen therapy unit was put into operation at the Collis P. Huntington Memorial Hospital in Boston. This machine incorporates a new principle of roentgen ray generation, which has been described elsewhere in detail by its designers and builders, Dr. Robert J. Van de Graaff and Dr. John G. Trump of the Massachusetts Institute of Technology.[3]

The generator is of the electrostatic belt-conveyor type. Negative electrons are supplied at approximately 10,000 volts to a series of six rapidly moving belts that travel from the ground to a high voltage terminal mounted on an insulator. The high voltage terminal may be charged to a negative potential of somewhat over 1,000,000 volts. This voltage is distributed to a multisectional porcelain tube of the cascade type by means of corona points. The tube is approximately 16 feet in length and extends through the floor of the generator room into the treatment room below. All roentgen radiation is produced at the lower end of the tube in a "transparent" anode of either lead or gold. The unit has a capacity of 1,000,000 volts at 3 milliamperes. This apparatus has been in use for the routine treatment of malignant disease since February 1937. It has proved to be exceedingly reliable in operation and delivers a very high radiation intensity which approximates in quality the gamma rays of radium.

The treatment of deep-seated neoplasms by the external application of radium in so-called packs and bombs is by no means a new or experimental procedure. The gamma rays of radium are the shortest, most penetrating rays available at present for cancer therapy.

From the Department of Radiology, Collis P. Huntington Memorial Hospital, Harvard University.

Read before the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

A large number of the cases reported have been seen in private practice. We are appreciative of the interest and cooperation shown by those urologists who have referred these cases.

1. Dresser, Richard, and Dumas, C. E.: Radiological Treatment of Cancer of the Skin, Urol. & Cutan. Rev. **42**: 295-297 (April) 1938.

2. Graves, R. C., and Dresser, Richard: Experiences with High Voltage Roentgen Therapy in the Treatment of Malignant Tumors of the Urinary Bladder, Tr. Am. A. Gen.-Urin. Surgeons **30**: 201-208, 1937.

3. Trump, J. G., and Van de Graaff, R. J.: Design of a Million-Volt X-Ray Generator for Cancer Treatment and Research, J. App. Physics **8**: 602-606 (Sept.) 1937. Dresser, Richard; Trump, J. G., and Van de Graaff, R. J.: The Production of Supervoltage Roentgen Rays by Means of an Electrostatic Generator, Am. J. Roentgenol. **38**: 758-761 (Nov.) 1937.

However, the amount of radiation that can be delivered to a deep-seated tumor is dependent not only on the penetrating power of the rays but also on the distance of the source of radiation from the patient. The greater this distance, within certain limits, the greater the depth dose. Radium is available in such comparatively small quantities that its application at distances greater than from 10 to 15 cm. is not feasible because of the excessive length of time for the treatment. Supervoltage roentgen rays, on the other hand, are not only short in wavelength but can be produced in intensities equivalent to many hundreds of grams of radium, and therefore their use at distances of from 50 to 100 cm. becomes entirely feasible.

A brief review of the physical characteristics of roentgen rays produced at 1,000,000 volts constant potential as compared with those generated at 200 kilovolts will aid in an evaluation of their use in the treatment of malignant disease. One-fourth inch (0.64 cm.) of lead is considered sufficient protection from 200 kilovolt roentgen rays. It takes from 5½ to 6 inches (14 to 15 cm.) of lead to absorb the direct rays produced at a constant potential of 1,000,000 volts.[4] This is the amount of lead commonly used for protection from radium.

The approved method of expressing the quality of an x-ray beam is that thickness of copper which, when interposed between the source of radiation and an ionization measuring instrument, will reduce the intensity of the rays 50 per cent. This is known as the half-value layer. The half-value layer for 200 kilovolt roentgen rays is approximately 1 mm. of copper; the half-value layer for 1,000,000 volt roentgen rays is 10.5 mm. of copper.

The average human pelvis measures 20 cm. in its anteroposterior diameter. Thirty-two per cent, or approximately one third, of the amount of 200 kilovolt radiation delivered to the surface of the pelvis reaches its center. In other words, the 10 cm. depth dose for 200 kilovolt roentgen rays is 32 per cent. By varying the factors of filtration and distance, this figure can be raised slightly. The 10 cm. depth dose for 1,000,000 volt roentgen rays is 51 per cent. It is also possible to raise this figure slightly. Approximately 19 per cent more radiation per unit of surface dose can be delivered to a neoplasm at the center of the pelvis with 1,000,000 volt roentgen rays than is possible with 200 kilovolt rays.

There are two differences in the clinical response to 1,000,000 volt roentgen rays which are of great importance. First, the tolerance of the skin to shorter wavelengths is greater than it is to longer wavelengths. It takes twice as much radiation to produce erythema of the skin with 1,000,000 volt rays as it does with 200 kilovolt rays. Second, general malaise, nausea and vomiting, so-called roentgen sickness, are less at the higher voltage.

Whether or not there is a greater selectivity of the shorter wavelengths for new growths is still a question. Most experimental work points to the fact that it is the quantity of radiation delivered to a tumor rather than the quality that is important. However, many trained observers who for years have employed large amounts of radium for external treatment are convinced that the shorter wavelengths are more effective in the destruction of neoplastic tissue.

4. Dresser, Richard, and Cosman, B. J.: Million Volt Roentgen Ray Protection, Am. J. Roentgenol., to be published.

Preliminary experiments on the irradiation of Drosophila (fruit fly) eggs have been carried out in collaboration with Dr. John C. Larkin, resident in radiology at the Peter Bent Brigham Hospital, Boston. By using some medium, such as a box of rice or a block of pressed wood, which absorbs roentgen rays in the same degree as human tissue, it has been shown that 1,000,000 volt roentgen rays are approximately 10 per cent less effective than 200 kilovolt rays in killing the eggs on the surface, but in the depths conditions are reversed and the shorter wavelengths are more effective than ionization depth measurements would lead one to expect. This experimental work checks well with our clinical observations. In other words, the physiologic depth dose is greater than that determined by ionization measurement.

Unless a new growth is small and superficially located, the commonly accepted method of external irradiation is small daily exposures extended over a period of several weeks or perhaps months. For several years we have been treating large epidermoid cancers of the skin with daily fractionations of 200 kilovolt roentgen rays.[5] It has been found that, if 200 roentgens a day is given, a total of from 4,000 to 5,000 roentgens is necessary to control such lesions. We believe that epidermoid carcinoma situated elsewhere in the body should respond in a similar manner to similar doses. If smaller daily doses are administered, a correspondingly larger total dose must be given to obtain results. We have learned from our experience with 200 kilovolt radiation of deep-seated pelvic tumors that a total dose of 4,000 roentgens cannot be administered to the neoplasm at the rate of 200 roentgens a day. The limitation has not been the reaction of the deeper tissues, such as the bladder and intestine, but has been dependent on the limit of tolerance of the skin and on the marked roentgen sickness that follows the administration of large daily surface doses. These undesirable factors are eliminated when 1,000,000 volt rays are used. Because of the greater depth dose, the greater tolerance of the skin and the lessened roentgen sickness, a daily surface dose of 400 roentgens is well tolerated, and 50 per cent of this dose is delivered to the new growth. The total tumor dose no longer is dependent on the reaction of the skin but is now limited by the tolerance of the intestine and bladder.

Immediate Results of Irradiation in Twenty-Six Cases of Carcinoma of the Bladder

	Cases	Per Cent
Regression either complete or so nearly complete that small remnants of tumor could be satisfactorily fulgurated or treated by implantation of radium	7	26.9
Partial regression of tumor with relief of symptoms of pain, frequency, hematuria, etc.	9	34.6
No regression of tumor and little or no symptomatic relief (5 cases previously irradiated at 200 kv.)	10	38.4

Of seven patients previously treated at 200 kilovolts, only two showed a fair response to higher voltage therapy

Our experience with supervoltage roentgen rays has been limited to fifteen months. We have brought the tumor dose of deep-seated pelvic lesions to a total of 3,000 roentgens, with daily exposures of approximately 400 roentgens to the surface, without untoward effect on normal structures. With this amount of radiation, symptoms of rectal and vesical irritation develop, but

5. Dresser, Richard, and Dumas, C. E.: The Treatment of Cancer of the Skin by Divided Doses of High Voltage Roentgen Rays, Am. J. Roentgenol. **36**: 332-336 (Sept.) 1936.

usually the patient recovers promptly. It is our belief that this dose is not sufficient to control epidermoid carcinoma permanently, but we believe that a total of at least 4,000 roentgens in the region of the tumor, administered at the rate of 200 roentgens a day to the tumor, may eventually be attained with safety.

The immediate results in twenty-six cases of carcinoma of the bladder treated with a tumor dose of approximately 3,000 roentgens are herewith reported. These cases were all in the so-called inoperable group or were recurrent after operation. They have been chosen without selection, and a number of them were in the last stages of advanced malignant disease. In seven cases, or 26.9 per cent, regression of the tumor was either complete or so nearly complete that small remnants of the growth could be satisfactorily fulgurated or treated by implantation of radium. Partial regression with relief of symptoms of pain, frequency, hematuria and the like occurred in nine cases, or 34.6 per cent. Two of these patients had previously been irradiated at a lower voltage. There was no regression of the neoplasm and little or no symptomatic relief in ten cases, or 38.4 per cent. Five of these patients had previously been irradiated at a lower voltage. Of seven patients previously treated at 200 kilovolts, only two showed a fair response to higher voltage therapy, as shown in the accompanying table.

These results are better than those which we have been able to obtain with lower voltage radiation. The majority of the patients have had only a slight general reaction, and the local reactions, as a rule, have not been severe. The papillary tumors have responded rather more satisfactorily than the infiltrating type.

This method at its present stage of development is not to be recommended as a substitute for surgical excision or radium implantation in favorable cases. It is our belief that the total tumor dose is still too small to control epidermoid carcinoma permanently, but it is our hope that eventually an amount of radiation can be safely administered to neoplasms of the bladder which will result in the cure of lesions now considered hopeless from any other therapeutic standpoint.

129 Bay State Road.

ABSTRACT OF DISCUSSION

DR. ROBERT S. STONE, San Francisco: I disagree with many statements that are being made about supervoltage irradiation. The question of depth dosage with supervoltage is a touchy one, because we talk about giving 200 roentgens to the surface, and that doesn't mean the same thing with the two different types of irradiation at all, so that one has to talk about surface dose when one is talking about depth dose, and one has to include the depth dose when one is talking about what one can give a patient. With regard to the question of skin erythema, I don't know that the roentgens we use in California and San Francisco differ from those used in other parts of the country, but the statement was made that one can give twice as much to the surface with supervoltage. I frequently have given 800 roentgens to the surface with 200 kilovolts at one sitting, and I certainly would not dare to double that with the other machine. So if one talks about skin erythemas one has to take into account the backscatter, the effects, and other elements. When the authors say that they were stopped by the cutaneous effects in using 200 kilovolts I wonder whether they were using 200 kilovolts at a long target skin distance and with a composition filter, or with 0.5 mm. of copper at 50 cm. They do not tell that. I think that if they use a longer target skin distance they will not be limited. With regard to the actual figures mentioned at the end of the paper on the improvement of supervoltage, it is difficult to compare any two sets of figures, and I have none of my own that I would care to bring forward. On looking at Dr. Ferguson's figures published last year on 200 kilovolts at long target skin distance, one finds that he had twenty cases in 1936 that showed remarkable one year regressions, or 55 per cent, whereas in the present case he had seven cases, or 26.9 per cent. This would prove that 200 kilovolts is much superior to supervoltage if one uses 200 kilovolts at a long target skin distance and give it in small daily fractions. Radiologists have got to get away from the idea of bigger depth doses and confine themselves more to the rate of giving, the total time it takes to give it, and reaction of the tumor as the treatment is being given.

DR. L. H. GARLAND, San Francisco: The problem of the relative efficiency of different voltages in the handling of a disease which is so often incurable appears to tax our judgment. The authors believe that one can give twice as many roentgens to the skin with a supervoltage unit as one can with a 200 kilovolt unit; that is, that supervoltage is only half as efficient as orthovoltage in the production of damage to the skin. On the other hand, they believe that supervoltage has twice as good an effect on the tumor at a depth of 10 cm. Now, if supervoltage is twice as destructive to the epithelial cells in the bladder tumor, it should also be twice as destructive to the epithelial cells in the skin. Having the privilege of observing patients treated by two different supervoltage units in this city, I have the distinct impression that the main advantage of a supervoltage unit lies in the large quantities of x-rays that it produces per minute, in comparison with the orthovoltage unit. Patients may therefore be treated with supervoltage units at a longer distance or in a shorter time than with ordinary units, a gain of a little time and not a gain of biologic efficiency. There is absolutely no proved cancericidal superiority of 400 or 800 kilovolt x-rays over 175 kilovolt x-rays. Stone (*Radiology* **30**:88 [Jan.] 1938) has emphasized that it is not the tolerance of the skin which is the limiting factor in adequate dosage of deep-seated tumors, using ordinary 200 kilovolt x-rays, but it is tolerance of small bowel epithelium and neighboring normal structures. Other factors, such as the daily dose, the total time of treatment and perhaps the intensity (roentgens per minute rate), are probably much more significant as regards improvement in results from radiation therapy than mere voltage. I have a patient with carcinoma of the bladder, clinically arrested for eleven years with 200 kilovolt irradiation alone. The lesion was recurrent subsequent to operation, affording material for biopsy. This, of course, is a very fortunate and unusual event. It is well to remember that about ten years ago papers were presented to this section of the American Medical Association extolling the virtues of 200 kilovolt irradiation over 140 kilovolt irradiation. Now, 800 kilovolt irradiation is fashionable. In ten more years doubtless 10,000 kilovolt irradiation will be the magic weapon. I do not wish to disparage the usefulness of roentgen irradiation in palliating and at times controlling bladder carcinoma; I merely wish to disparage giving undue credit to supervoltage. Irrespective of the voltage which one uses in the treatment of these tumors, it is of utmost importance that they be centered properly. It is wise to check one's centering occasionally by roentgenograms made on the roentgen therapy table, with just a few cubic centimeters of sodium iodide in the bladder.

DR. HENRY J. ULLMANN, Santa Barbara, Calif.: Unfortunately, I haven't got a supervoltage machine to use. But I do not feel that it is fair to report cases in which the time has been so short that there is simply palliation. I have had a patient for two years now who had a carcinoma of the bladder, who was treated at 200 kilovolts, with filtration of 2 mm. of copper, 71 cm. distance, treated simply fore and aft, only two ports, over a period of four months, and a urologist reported only a short time ago that there was no trace of carcinoma. Now that is not important to cure; that is palliation. I have yet to see a carcinoma of the bladder that is not benefited, at least temporarily.

DR. JOHN T. MURPHY, Toledo, Ohio: I want to defend the authors in reporting this series of cases, because I asked them to do it. I wanted just this discussion. For the benefit of those men who have a machine of only 200,000 volts, and I

have one machine of higher voltage than that, I want to say that I am treating all my carcinomas of the bladder and prostate with 200 kilovolts. I tried 400 kilovolts at the usual technic, which has never exceeded 200 roentgens a day, with a heavy filter, and I found that the permanent results were not any better than previously, and the patient's symptoms were not so good during treatment. The last year I have been using the so-called 'Ferguson technic' at 1 meter with a relatively heavy composition filter, with 100 roentgens a day, 4 roentgens a minute, one field treated daily, five fields, 3,000 roentgens per field. I have no cured cases of either. I have, however, been able to do what doctors should always try to do: have alleviated the symptoms.

DR. RICHARD DRESSER, Boston: I anticipated some difference of opinion and I have not been disappointed. Regarding the size of the field, I agree with Dr. Stone. If one employs large portals, 20 by 20 cm., there is little difference in the depth dose as measured with a thimble ionization chamber. However, I think it bad practice to use a 400 square centimeter field in order to increase the depth dose when the disease-bearing area may be included by a smaller portal. The use of large fields necessitates the irradiation of much normal tissue, which may cause unnecessary damage. With 1,000,000 volt roentgen rays it is possible to limit treatment to a small disease-bearing area without affecting the depth dose. With regard to our 200 kilovolt technic, we have employed long distances up to 80 cm. We have given daily doses varying from 300 to 600 roentgens, depending on how well the patients tolerated the treatment. The results of 200 kilovolt therapy which Dr. Ferguson reports are better than those which we have been able to obtain. In reporting this series of cases, in which the treatment has been recent, we have not claimed any cures. However, regression of disease and palliation have been more pronounced than with our 200 kilovolt technic. Supervoltage roentgen radiation has been branded as experimental, but let us suppose that one could acquire 1,000 Gm. of radium, which would enable him to treat at a distance of from 70 to 80 cm. Such a procedure would not be considered particularly experimental. Yet this would represent essentially the same type of therapy that is being administered with 1,000,000 volt roentgen rays. In other words, the object of the use of supervoltage roentgen apparatus is to produce a type of radiation which is equivalent or nearly equivalent to the gamma rays of radium and in amounts sufficient to allow the employment of a long focal skin distance. The amount of radiation delivered to a deep-seated tumor is therefore much greater than it is possible to give with amounts of radium now in ordinary use. Shall we be treating at 10,000,000 volts a few years from now? I do not know. I think we should be satisfied with 1,000,000 volts for a while until we have found what may be obtained in the way of end results. It is the opinion of a number of physicists that, should the necessity arise, it will be mechanically possible to produce roentgen rays at 3,000,000 volts or more.

The Infinitesimal Currents of Nerve Centers.—Neurophysiology is today one of the most active fields of hyphenated science. The technics are becoming increasingly refined. A century and a quarter ago it was an epoch-making discovery to make a simple distinction between the sensory and motor roots of the spinal cord. Today the almost infinitesimal currents of nerves and nerve centers are registered, their rhythms photographed in curves of beautiful precision. With devices for both auditory and visual magnification, the electrometry of the brain has swiftly amassed voluminous data—more in fact than the investigatory cerebrum can immediately cope with. By the method of thermocoagulation, individual layers of the brain cortex are being separately explored. By means of ultra delicate probing, microscopic groups of nerve cells are being identified in the medulla. Such researches are destined to give us an intimate knowledge of the architecture of the nervous system, and this knowledge will make our concepts of human behavior more deterministic and mechanistic in the best scientific sense.—Gesell, Arnold: Scientific Approaches to the Study of the Human Mind, *Science* **88**:225 (Sept. 9) 1938.

Clinical Notes, Suggestions and New Instruments

THE BLOOD SUGAR AND CARDIAC INVOLVEMENT IN RHEUMATIC FEVER

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The rarity of rheumatic heart disease in diabetic patients is significant. Several authors have made references to the infrequency of the development of the former condition in these patients. In a study of fifty-eight cases of active rheumatic heart disease, I have been impressed by the high blood sugar tolerance and low blood sugar curve found to be present in many of these patients.

Joslin[1] observed only six cases of acute rheumatic fever in approximately 6,000 cases of diabetes during the course of twenty-nine years. He said: "Rheumatic heart disease is of extraordinary rarity. In 1917 I could recall no case of diabetes under fifty years of age in which the patient complained of shortness of breath or presented the signs of an incompetent heart due to valvular disease of a definite and unquestionable rheumatic origin. In a series of fifty-six autopsies performed on young adult diabetics, only one case of rheumatic heart disease was found."

Howard F. Root[2] wrote in part: "Strangely enough, in the ten years from 1920 to 1930 rheumatic heart disease was not encountered in diabetic autopsies at the Deaconess Hospital. Since then there have been five or six cases among two hundred diabetic autopsies."

Joseph H. Barach[3] wrote: "In my group of 350 cases of diabetes, a history of rheumatic fever was obtained in thirty-seven patients. These thirty-seven cases of rheumatic fever occurred prior to the development of diabetes. In no case have I seen acute rheumatic fever in a diabetic. Valvular disease of the heart develops in more than half of the patients having rheumatic fever. Under such conditions, in the thirty-seven diabetics who had rheumatic fever we should have found valvular disease of the heart in eighteen or nineteen cases. It is therefore highly surprising to note that in these thirty-seven patients only one case of valvular disease was discovered." Barach concluded: "One may deduce from these observations that when rheumatic fever attacks an individual who is a potential diabetic, or rather one who is destined to become diabetic, such a patient's heart will be comparatively immune to endocardial involvement."

As the specific cause of rheumatic fever is unknown and its treatment unsatisfactory, progress in the treatment of the disease process and in the solution of its etiologic factor would be made were we able to discover or create a condition in the body which would be inimical to the infection.

From the observations of the authors quoted it may be indicated that diabetes mellitus is a body state which protects the individual from cardiac involvement in the event of his contracting rheumatic fever. If this is a fact, is the protective influence due to hyperglycemia, to undetected periods of acidosis, or to something in the secretions of the pancreas, liver or endocrines?

If the hyperglycemia in the diabetic patient exerts a protective action against cardiac involvement, it would be expected that individuals who are susceptible to, or those who contract rheumatic heart disease would have a low or flat blood sugar tolerance curve and therefore a high sugar tolerance.

From the Medical Services of the Municipal and Mount Sinai hospitals.
The blood sugar determinations in the series of eleven children were made at the Mount Sinai Hospital, New York, through the courtesy of Dr. Samuel Karelitz on the service of Dr. Bela Schick.

1. Joslin, E. P.: The Treatment of Diabetes Mellitus, ed. 6, Philadelphia, Lea & Febiger, 1937.
2. Root, Howard F.: Personal communication to the author, Oct. 22, 1934.
3. Barach, Joseph H.: The Incidence of Rheumatic Heart Disease Among Diabetic Patients, Am. Heart J. **2**: 196-201, 1926-1927.

Holsti,[4] in his research on patients with acute or chronic lesions tested with 100 Gm. of dextrose in 300 Gm. of water, confirmed the upset in the balance of the internal secretions in these conditions. In several cases there were indications of symptomatic hyperthyroidism, and, in a few, alimentary or even spontaneous glycosuria indicated derangement of pancreatic function. In still others the glycemia was of the hypothyroid type.

McCulloch[5] stated that all cardiac children of the type who have abdominal pain and vomiting associated with myocarditis have a low blood sugar content.

In an attempt to evaluate the relationship of the blood sugar content and cardiac involvement in acute rheumatic fever, I determined the blood sugar tolerance in cases of rheumatic fever and active rheumatic heart disease.

Thus far only fifty-eight such examinations have been made in fifty-eight patients with active involvement. This series of cases is not large but is interesting, and this preliminary report is made with the hope that further and more widespread study of this apparent relationship be undertaken by others with a larger material at their disposal.

Blood sugar tolerance was studied in forty-seven adults and in eleven children. In the former group the age limits ranged from 20 to 45 years, in the latter from 4 to 11 years. A series of thirteen control cases was used.

In the adults there was no case of acute rheumatic fever, but there was definite evidence in each patient of active endocardial involvement due to rheumatic fever. This was proved by history, physical examination and laboratory evidence. The eleven children had acute rheumatic fever at the time the blood sugar determinations were made. The thirteen controls were adults and children with conditions other than diabetes or heart disease. One hundred Gm. of dextrose was administered for each test and the results were recorded in milligrams per hundred cubic centimeters of blood.

Results of Tests

	Fasting	½ Hr.	1 Hr.	2 Hr.	3 Hr.
Adults					
Low curves: average of 24 cases	76	99	91	83	...
Higher curves: average of 23 cases	82	171	145	113	...
Average reading in 47 cases	79	135	118	98	...
Children					
Low curves: average of 9 cases	69.5	90	86	83	79
Higher curves: average of 2 cases	110	173	195	168	143
Average reading in 11 cases	89.5	134.5	138	131	111
Average of 58 cases	80.9	134.8	121.8	121.3	...
Average of 13 control cases	85	155	112	87	...

SUMMARY AND CONCLUSIONS

A review of the literature shows that rheumatic heart disease is but rarely encountered in patients having diabetes mellitus. A study of the blood sugar tolerance in a small series of patients with rheumatic heart disease and rheumatic fever indicates the desirability of further investigation as to this relationship.

Attention must be directed to the significant fact that nine of the eleven children with rheumatic fever had a flat blood sugar tolerance curve.

Blood sugar determinations should be made in all patients with acute rheumatic fever. If this percentage of flat curves holds true in a larger study of such cases, it would call for the administration of large amounts of dextrose to determine the effect, if any, on the course of rheumatic fever and its cardiac complications.

Dextrose may play an important role in preventing rheumatic heart disease in patients with acute rheumatic fever who have a low sugar tolerance curve.

705 Asylum Avenue.

4. Holsti, Ö.: Blood Sugar with Articular Rheumatism, Finska läk.-sällsk. handl. **66**: 78-105 (Jan.-Feb.), 217-245 (March-April) 1924.
5. McCulloch, Hugh, in discussion at Round Table Conference on Heart Disease, J. Pediat. **5**: 565 (Oct.) 1934.

Special Clinical Article

THE TREATMENT OF TUBERCULOSIS UNDER THE GUIDANCE OF ORGANIZED MEDICINE

THE PENNSYLVANIA PLAN FOR TUBERCULOSIS

CLINICAL LECTURE AT SAN FRANCISCO SESSION

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PHILADELPHIA

The Pennsylvania plan for tuberculosis has two interdependent parts. The first is the striking of a balance between case finding, case treatment and rehabilitation. The second is the coordination of all groups engaged in the tuberculosis fight, first, through the establishment of a clear understanding on the part of all groups of the obligations and necessary limitations of each group, and, second, through a tuberculosis organization within organized medicine to act as a force to coordinate all groups, to take the initiative in setting standards for case finding, case treatment and rehabilitation and to work for the meeting of those standards by means which will be elaborated presently.

The organization consists of (1) a tuberculosis committee in every county medical society, (2) a tuberculosis committee in every state medical society and (3) a tuberculosis committee in the American Medical Association (not yet achieved). The first is coordinated by the second and the second by the third.

I. CASE FINDING

A. *Education of the Public.*—Education of the public is the great field of the National Tuberculosis Association and its component societies. Since its beginning near the start of this century it has been doing a great job in spite of unorganized opposition or indifference on the part of organized medicine, and to it belongs the greatest credit for the past drop in the death rate for tuberculosis.

To educate the public requires a great amount of money. Administrators of broad intelligence and administrative ability are necessary to carry on a great teaching movement; just as the quality of the faculty determines the quality of a college, so has the quality of the work of the National Tuberculosis Association and its component societies depended on the excellence of the personnel. The National Tuberculosis Association has been able to raise the necessary funds by selling Christmas seal stamps. It should be recognized by every physician that that money should be spent for education of the public, not for treatment of tuberculosis. Wrong views on this subject have led to subterfuge in some areas, which in the long run have been detrimental to the National Tuberculosis Association. This has been the fault of physicians in lacking an organization within organized medicine to support stanchly the National Tuberculosis Association in the field in which it is the master and to be responsible for the enlightenment of physicians, from whom in the past undiscriminating criticism has come.

In Pennsylvania, since adoption of the Pennsylvania plan there has been cooperation with the National

From the Medical Society of the State of Pennsylvania.
Read in the Medical Division of the General Scientific Meetings at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 14, 1938.

Tuberculosis Association and its component societies, and this has been of tremendous advantage to the public, organized medicine and the National Tuberculosis Association. In Philadelphia the benefit has not been limited to tuberculosis. The experience and organized facilities of the Philadelphia Health Council and Tuberculosis Committee, the local component society of the National Tuberculosis Association, have been freely extended to advance many activities of the Philadelphia County Medical Society. Before organized medicine cooperated to fight tuberculosis, these bodies were enemies, to their mutual disadvantage and to the great detriment of the public.

B. *Education of the Medical Profession.*—1. Education of the Medical Profession in the Medical School: The American College of Chest Physicians has had functioning during the last several years a Committee on the Teaching of Chest Diseases in the Medical Schools, which has been working with the deans of all accredited medical schools to improve the teaching of diseases of the chest. It is a lamentable fact that there is no uniformity in the time devoted to this subject, and many medical schools do not even have a course in diseases of the lungs taught by a specialist in such diseases.

2. Education of the Medical Profession in the Practice of Medicine:

(*a*) The *American Review of Tuberculosis,* the finest and most comprehensive scientific publication on tuberculosis for the chest specialist and research worker, is published by the National Tuberculosis Association.

(*b*) *Diseases of the Chest,* a practical monthly journal on pulmonary disease, features early diagnosis and the modern treatment of tuberculosis. It is part of the Pennsylvania plan to have this journal go to every practicing physician every month. The circulation is now 10,000 monthly. The articles are written by specialists on pulmonary diseases primarily for general practitioners, who find most of the cases of pulmonary tuberculosis.

(*c*) Tuberculosis abstracts are furnished by the National Tuberculosis Association to all medical periodicals for reprinting and to physicians on request.

(*d*) Tuberculosis programs and papers for every variety of medical meeting are fostered by cooperation of the county medical societies' tuberculosis committees with the corresponding committee of the state medical society, with the National Tuberculosis Association and its component societies and with the American College of Chest Physicians. It is necessary to have whole hearted cooperation between all of these organizations to secure delivery of the greatest possible number of excellent papers on tuberculosis before the maximum number of medical meetings.

C. *Education of State Legislators.*—As large sums of money must be appropriated by the state legislative assembly to fulfil all parts of the Pennsylvania plan, it is necessary that all members of both houses of the state legislature be informed on that plan and kept fully cognizant of progress under it. To accomplish this purpose, the tuberculosis committee of each county medical society is made responsible for keeping in close instructive contact with every state representative and senator in the county. The informative procedure should cover the needs of the state in case finding, case treatment and rehabilitation. Similar responsibility rests on each member of the tuberculosis committee of the state medical society for every legislator in his councillor district. This work must be carried on in close cooperation with the legislative committee of the state medical society. To secure this cooperation, the legislative committee of the state medical society must be kept fully informed by the tuberculosis committee of the state medical society of all of the legislative necessities under the Pennsylvania plan.

D. *Method and Proper Cost of Case Finding.*—Opinions vary widely concerning the best methods of case finding and the proper cost of case finding. The two are linked indissolubly. To a large extent the difference in opinion is due to the fact that a method which is effective and economical in an area with a low incidence of tuberculosis may be ineffectual and extravagant in an area where the percentage of persons with a positive reaction to tuberculin is high. Likewise a method satisfactory for one age group is not suited for all age groups. Therefore, under the Pennsylvania plan we recognize the following principles of case finding:

1. The least expensive practical method of case finding in public health work is the maintenance of a constant follow-up in the home by nurses specializing in tuberculosis of persons who have been in contact with patients known to be tuberculous or persons who have died of tuberculosis, together with the maintenance of thoroughly distributed tuberculosis clinics, out of which the nurse operates. The clinic should be properly housed and staffed with a competent tuberculosis specialist of excellent local reputation who is trained to perform artificial pneumothorax. The clinic should be equipped with fluoroscope and pneumothorax apparatus. Such a clinic will be able to hold the confidence of the local public and the confidence of local physicians, both of which are necessary for successful case finding. Tuberculosis is knowingly concealed by the patient's family and the family physician from incompetent and poorly equipped tuberculosis workers. Case finding is dependent on proper case treatment and is useless without it.

2. Testing with tuberculin should be followed by the taking of roentgenograms in cases in which the reaction is positive in (*a*) areas where the percentage of positive reactions is very low and in (*b*) special groups in which the incidence of active adult type tuberculosis is high.

In these special groups, such as the age group from 16 to 24 years, racial groups, slum area groups, certain occupational groups, and others in which the incidence of the active, adult type of tuberculosis is high, surveys with the inexpensive paper film method are applicable. There has been objection to this method in many areas on the part of organized medicine because of the belief that local roentgenologists or other physicians would be deprived of income. As a matter of fact, however, such surveys have led to increased case finding, with a consequent increase in work for both private roentgenologists and private physicians, in every area where they have been conducted.

The Pennsylvania health department under Dr. MacBride-Dexter has purchased two motorized x-ray field units, known as juvenile tuberculosis case finding units. These units are the last word in x-ray equipment and were designed especially for the department of health and approved by the Moore School of Engi-

neering of the University of Pennsylvania. They are so constructed that they can be dismounted, reassembled in the school or other building where the roentgenograms are made and then remounted on the trucks for transportation to the next town or city.

Each unit is accompanied by a trained roentgenologist and a technician and is sent into the counties for use with first year high school students in all schools of the state outside of Pittsburgh and Philadelphia. No child is examined without the consent of the parents, consent slips being sent out in advance. As the first step in the examination, the student is given the Mantoux test, and roentgenograms are taken of all those with a positive reaction. The films are sent at the close of each day's work in the field to the x-ray laboratory in Harrisburg, and the reports of the roentgenograms are sent to the parents and the family physicians.

It is interesting to note that in the first six counties visited by this unit in 1936 50 per cent of the parents consented to have their children given the Mantoux test. Of 37,485 ninth grade children examined in forty counties, 11.3 per cent gave positive reactions and approximately 155 showed symptoms of active tuberculosis.

Permission was requested from the superintendent of public instruction, which he readily gave, to take roentgenograms of the first year and senior students at the state teachers' colleges. Five hundred positive reactions were found in these schools. These tests will help to prevent teachers who have tuberculosis from coming in contact with children in the public schools.

II. CASE TREATMENT

Organized medicine alone has the combination of (*a*) knowledge of proper modern treatment of tuberculosis, (*b*) power and influence, when properly organized, to establish such treatment in every state in the United States and (*c*) lack of fear of the effect of the use of such power on the income of the organization.

The Pennsylvania plan set-up, as operating in Pennsylvania, is as follows: A. Dr. Edith MacBride-Dexter, secretary of health of the Commonwealth of Pennsylvania, is the leader of the Pennsylvania plan. B. In cooperation with her there is a tuberculosis committee of the Pennsylvania state medical society, with twelve members, one from each of the twelve councilor districts of the state (a wise arrangement contributed by Dr. Frederick J. Bishop, president of the Pennsylvania state medical society). C. A tuberculosis committee has been formed in each of twenty-three county medical societies in the state, those counties containing 53 per cent of the population of the state.

The function of the state society tuberculosis committee is to coordinate the activities of the county society tuberculosis committees and to support the accomplishments of Dr. MacBride-Dexter's Pennsylvania plan.

Under the plan there have been established in sanatoriums (*a*) proper living quarters for the sanatorium physicians, with private cottages for the married physicians and their families, (*b*) at least one physician to fifty patients, (*c*) security in their jobs for the sanatorium employees, (*d*) salaries for physicians at least equal to those paid in the army and navy, with a rising scale, and (*e*) sufficient nurses, ward maids and orderlies to do the work of the institution so that the patients are not called on to do the work.

It is recognized by organized medicine and the progressive Secretary of Health, Dr. MacBride-Dexter, that patient labor in the sanatorium is not proper rehabilitation and that the necessity leads to abuses and bias of judgment on the part of physicians when work in the sanatorium has to be done by patients and some patients must be selected to work in order to get the work done. Rehabilitation must come after cure, not during cure, in a sanatorium maintained to furnish rest, the primary cure for tuberculosis. Having sick patients work is false economy as well as being destructive of human life.

Under Dr. MacBride-Dexter, Pennsylvania has engaged in a huge tuberculosis sanatorium building program.

Organized medicine, with Dr. MacBride-Dexter, has secured a raise of approximately 50 per cent in the base pay of physicians in the state sanatoriums, together with a substantial increase in the pay of many of the other classes of sanatorium employees.

The practice of examining patients fluoroscopically before every pneumothorax refill, a very important reform, has recently been established. Fluoroscopic examination means so much in the avoidance of losing the pneumothorax collapse and in the avoidance of and the early detection of complications that it may be called the greatest guide to "pneumothorax judgment."

Patient labor is being abandoned as rapidly as finances will permit. The ideal is accepted and will be reached.

The tuberculosis clinic, as described under the heading case finding, will cost a great deal. Little has been accomplished in this connection. Organized medicine is working, however, with Dr. MacBride-Dexter to get the necessary personnel and equipment.

III. REHABILITATION

It is recognized that the rehabilitation of the tuberculous patient is in the early experimental stage. At the present time the patient, the sanatoriums and the public health organizations are suffering from the experiments on account of failure to recognize the following rules:

1. A patient should be cured before being rehabilitated. Rest of the diseased lung, of the body and of the mind is necessary and the only cure for tuberculosis.
2. The sanatorium is not the place for rehabilitation. The sick need the beds in the sanatorium; the cured patient can be rehabilitated more cheaply at home.
3. Rehabilitation should not place the cured patient in a position where the public is unduly menaced should reactivation of the disease occur.

All of my patients who are being rehabilitated by governmental agencies are being trained as "beauticians." They are not yet cured. Many are still receiving pneumothorax treatment. If their sputum becomes positive again they may take many of their customers back to the sanatorium with them. It would be almost as well to train them to be dietitians or chefs. It is hoped that when the Pennsylvania plan is further established in Pennsylvania the laymen functioning in rehabilitation schemes will be brought more into cooperation with the tuberculosis organization in organized medicine.

NOTE.—After this paper was written, the following letter was received from M. M. Walter, director of

vocational rehabilitation in the Department of Public Instruction of the Commonwealth of Pennsylvania:

June 6, 1938

My dear Doctor Burge:

It was very kind of you to give me a list of names of Chairmen of the County Tuberculosis Committees in this state. The information has been sent to all of our district offices with the suggestion that each one of the physicians be contacted as soon as possible and arrangements made to have all tuberculosis cases that may be eligible for the services of this Bureau, referred to us by the local committees. Furthermore, if possible, a plan will be worked out to have the chairmen act as examining physicians for us in determining the physical status of the clients.

You may be interested to know that several years ago a plan of cooperation was worked out with the State Department of Health, to have all the State Sanatoriums refer eligible cases upon discharge from such institutions, to the Bureau of Rehabilitation. At the present time, 28 arrested tuberculosis cases are being trained in schools and colleges under our supervision.

I assure you that the Bureau of Rehabilitation will be very happy to cooperate with your committees in the rehabilitation of any clients who are eligible for our services.

Cordially yours,
M. M. WALTER
R.

MMW : DR Director, Vocational Rehabilitation.

One should not forget the fiasco of rehabilitation of the veterans of the great war or the rackets that thrived under that cloak.

1930 Chestnut Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

THE EFFECT OF HEAT ON THE BLOOD VOLUME AND CIRCULATION

H. C. BAZETT, M.D.

PHILADELPHIA

The effect of heat on the blood volume and circulation is so familiar that it seems necessary to explain why it is being discussed again. It seems important, however, to stress certain controversial points that are less generally known and to contrast the effects of high temperatures applied in acute experiments or treatments of short duration with those of milder temperatures continued chronically for days. The mode of adaptation of subjects to mild temperatures (of the order that has to be endured in the summer in New York) may prove worthy of analysis for its clinical interest. Preliminary study seems to indicate that air-conditioned rooms should be added to the equipment of physical therapy departments. In such an analysis of the effects of heat it is necessary to distinguish the parts played by (*a*) local dilatation in the cutaneous vessels with its accompanying local increases in the rate of flow, capillary pressure and fluid transudation; (*b*) compensatory reduction of the vascular bed in areas other than the skin, which allows dilatation in the cutaneous vessels even when the blood volume is unchanged or reduced; (*c*) increases in blood volume on exposure to heat which form an alternative method of compensation in lieu of vasoconstriction, and (*d*) alterations in cardiac output. If these factors could be adequately analyzed, conclusions might be reached which would serve as a guide in the use of heat in physical therapy. Adequate answers are not available at present in many cases, but that need not discourage a statement of the problem.

From the Department of Physiology, University of Pennsylvania School of Medicine.

First, it is well to review the changes in the circulation produced by the employment of relatively intense heat—the acute reactions, which are most familiar. In a peripheral area, such as a limb exposed to heat, dilatation of the vessels occurs so that the blood contained in the area is much greater. Thus Benson [1] finds increases in the volume of the foot and leg immersed in water at from 40 to 47 C. (104 F. to 116.6 F.) which average 2.76 per cent of the volume of the limb. Simultaneous heating of the whole surface of the body should increase the blood content of the skin, probably by half a liter or more. Such a redistribution of blood demands either an increase in blood volume or a compensatory reduction of the vascular bed in other areas.

The vessels involved in the dilatation are arterioles, capillaries and veins. The great reduction in peripheral resistance which allows rapid rates of flow proves that arterioles are concerned, while the changes in the large veins may be directly observed; changes in the capillaries and venules may be secondary to those in arterioles, but evidence of direct effects is advanced by Capps.[2] The dilatation is accompanied by a very rapid flow. For instance, Prinzmetal and Wilson [3] describe in the normal arm an increase from a blood flow of 1.7 cc. per hundred cubic centimeters per minute in a bath at 24 C. (75.2 F.) to one of 14.9 cc. in a bath at 45 C. (113 F.). The greater part of this increased flow depends on an increased cutaneous circulation, though in such changes the deeper flow to the muscles may also be somewhat increased. The greater rate of flow increases thermal conductivity, allowing rapid transfer of heat inward if the cutaneous temperature is above that of the rectum or of heat outward if the thermal gradient is of normal direction. In either case the increased rate of blood flow makes the surface and deep temperatures approach each other, and it is this fact which makes cutaneous temperature measurements useful in determining the cutaneous circulation.[4]

The vasodilatation in the skin is accompanied by a considerable rise in capillary pressure, as has been demonstrated by Landis,[5] and this increase in capillary pressure affects fluid transudation, so that edema may accumulate under appropriate conditions at a more rapid rate at the higher temperatures.[6] In the skin such fluid transudates must increase the moistness of the epidermis and so increase fluid loss by evaporation.

1. Benson, Simon: Volume Changes in Organs Induced by the Local Application of External Heat and Cold and by Diathermy, Arch. Phys. Therapy **15**: 133-148 (March) 1934.

2. Capps, R. B.: A Method for Measuring Tone and Reflex Constriction of the Capillaries, Venules and Veins of the Human Hand with the Results in Normal and Diseased States, J. Clin. Investigation **15**: 229-239 (March) 1936.

3. Prinzmetal, Myron, and Wilson, Clifford: The Nature of the Peripheral Resistance in Arterial Hypertension with Special Reference to the Vascular System, J. Clin. Investigation **15**: 63-83 (Jan.) 1936.

4. Burton, A. C., and Bazett, H. C.: A Study of the Average Temperature of the Tissues, of the Exchanges of Heat and Vasomotor Responses in Man by Means of a Bath Calorimeter, Am. J. Physiol. **117**: 36-54 (Sept.) 1936.

5. Landis, E. M.: Capillary Pressure and Capillary Permeability, Physiol. Rev. **14**: 404 (July) 1934.

6. Landis, E. M., and Gibbon, J. H., Jr.: The Effects of Temperature and of Tissue Pressure on the Movement of Fluid Through the Human Capillary Wall, J. Clin. Investigation **12**: 105-138 (Jan.) 1933.

It has been demonstrated [7] that such adjustments of the degree of moistness of the skin do occur and parallel the changes in circulation through the skin both above and below the true sweating level.

The subject of water loss from the skin is of such importance to physical therapists that it deserves a few moments of digression. This loss may be considered under three heads: (*a*) water evaporated from fluid transudates of the blood without the intervention of the sweat glands; (*b*) invisible sweat—invisible since it is evaporated as rapidly as it is secreted—and (*c*) visible sweat. Loss from fluid transudates can be distinguished from that due to sweat by the fact that there is no loss of chloride with fluid transudates. It is the only method of water loss in the skin in those animals (and the occasional human subjects) which are devoid of sweat glands. In treatment by heat this loss can be entirely prevented if a moist environment is used instead of the relatively dry atmospheres. On the other hand, fluid loss from sweating cannot be prevented; sweating can, however, probably be minimized if the rate of rise of temperatures is kept low. Insensible loss of fluid is largely dependent on the evaporation of transudates; it is by no means a negligible quantity, though much smaller in amount than losses which may be attained with visible sweating. Insensible loss from the skin amounts to some 15 cc. per square meter per hour or more under normal resting conditions and may exceed 50 cc. on exposure to heat. Gross sweating may give losses of the order of 500 cc. per square meter per hour.

The mechanisms involved in local vasodilatation include the local direct effects of heat on the vessels themselves, inhibition of vasomotor tone induced through a rise of temperature occurring centrally in the hypothalamus and inhibition of vasomotor tone induced reflexly. Direct effects of heat on the vessels may be demonstrated in a sympathectomized limb [8] or in an area completely denervated.[9] That a rise in central temperature may induce vasodilatation can be seen in the dilatation observable in the vessels of the arm when the feet are immersed in hot water. This does not appear to be reflex in origin, for it occurs only after a considerable delay, and then only when the internal temperature is rising.[10] Such a dilatation is induced through nerve channels and is absent in a sympathectomized limb.

Reflex dilatation due to stimulation of sensations of warmth in the skin has sometimes been denied, though reflex vasoconstriction to cold is generally admitted. Such vasoconstriction may be not only induced but also inhibited reflexly. For instance, exposure of a large area of the skin to quite a small change in temperature gives a sensation of warmth associated with vasodilatation in the skin and a fall of internal temperature through the redistribution of heat.[11] Such changes must have a reflex origin. If the thermal change is great, local effects of heat on the vessels and the mild inflammation which may accompany slightly painful heat may both play a part in the development of vasodilatation. In the inflammatory reactions reflexes of the axon type are probably involved. With changes in surface temperature of 1 degree or less such factors presumably play negligible roles, and true reflexes must be mainly involved.

In response to heat not only is dilatation observable in the skin but there is a compensatory constriction in the central vessels, particularly in the splanchnic area. The reflex character of this response is most readily demonstrated in the central vasodilatation induced on exposure of the skin to cold, for the change then develops very rapidly.[12] Constriction of the central vessels is essential in the adjustment to rapid changes on two grounds: (1) to prevent too great a lowering of the effective peripheral resistance, which would either lower blood pressure or demand a very large cardiac output to maintain the pressure level; (2) to compensate for any increase in the vascular bed in the skin by a reduction in the central vessels. On the balance of these two compensations depends the effect of heat on cardiac output and blood pressure.

Cardiac output may be measured in man, and from its relation to blood pressure the effective peripheral resistance may be calculated. In this way the changes induced by heat can be analyzed. The effect of heat in its early stages is to cause a reduction of the effective resistance to a level some two thirds or one half of the normal; that is to say, the effect of vasodilatation in the skin is only partially balanced by vasoconstriction in deeper areas. The blood pressure is, however, little changed, for the effect of lowered resistance is counteracted by that of an increased cardiac output. It has already been pointed out that the local circulation may be increased by heat to almost ten times the normal; the increase in the rate of flow in the skin's vessels themselves is much greater; the increase in total cardiac output is much less, commonly of the order of from 50 to 100 per cent. Mild heat usually produces a slight fall in blood pressure; with greater heat the increased cardiac output becomes the more important factor and the blood pressure is increased; in either case some constriction of central vessels is probably present. In the early stages this central arteriolar constriction, combined with contraction of blood reservoirs such as the spleen, is able to maintain the vascular bed within normal limits and to insure an adequate venous return to the heart. In later stages reduction of the blood volume through sweating coupled with the continued dilatation of all the vessels in the skin makes the maintenance of an adequate venous return very difficult or impossible. To meet such emergencies, contraction of the central vessels has to be extended, and arteriolar constriction may be employed for its effect on the volume of the vascular bed rather than for that on peripheral resistance. Under such conditions the total effective peripheral resistance may be raised above the normal value in spite of the lowered resistance in cutaneous areas, and the blood pressure may be elevated even though adequate levels of venous return and cardiac output are not successfully maintained. Consequently, a considerable rise of blood pressure on exposure to heat may not be evidence of a good reac-

7. Winslow, C.-E. A.; Herrington, L. P., and Gagge, A. P.: Physiological Reactions of the Human Body to Various Atmospheric Humidities, Am. J. Physiol. **120:** 288-299 (Oct.) 1937.

8. Freeman, N. E.: The Effect of Temperature on the Rate of Blood Flow in the Normal and in the Sympathectomized Hand, Am. J. Physiol. **113:** 384-398 (Oct.) 1935.

9. Trotter, W., and Davies, H. M.: Experimental Studies in the Innervation of the Skin, J. Physiol. **38:** 134-246, 1909.

10. Pickering, G. W.: The Vasomotor Regulation of Heat Loss from the Skin in Relation to External Temperature, Heart **16:** 115-135 (July) 1932. Gibbon, J. H., Jr., and Landis, E. M.: Vasodilatation in the Lower Extremities in Response to Immersing the Forearms in Warm Baths, J. Clin. Investigation **11:** 1019-1036 (Sept.) 1932. Uprus, V.; Gaylor, J. B., and Carmichael, E. A.: Vasodilatation and Vasoconstriction in Response to Warming and Cooling the Body: A Criticism of Methods, J. Clin. Sc. **2:** 301-316 (Dec.) 1936.

11. Burton and Bazett.[4] Uprus, Gaylor and Carmichael.[10]

12. Rein, H.: Vasomotorische Regulationen, Ergebn. d. Physiol. **39:** 28-72, 1931.

tion; on the contrary, it is apt to indicate that intense arteriolar vasoconstriction has been necessary. In this case it provides a warning that the strain is severe. The vasoconstriction is brought into action, with its consequent reduction in local flow of blood in those areas in which such reduction in flow is least harmful,[13] but in no area can such vasoconstriction be considered entirely innocuous. Associated with arteriolar constriction there is constriction of large arteries[14] and probably also of veins; reduction of these larger vessels is unlikely to modify to any extent resistance to flow, and it should be considered as exerting mainly a reservoir action. Constriction of all these vessels is not peculiar to incipient circulatory failure from dehydration by heat, for it may be observed in an entirely similar manner, accompanied by the danger signal of a rise in arterial blood pressure in reactions to moderate hemorrhage.

The only alternative adjustment to compensatory vasoconstriction is an increase in blood volume. Evidence of such an increase in the earlier stages of exposure to heat has been advanced by many. There is a slight initial reduction of the hemoglobin, red cell and serum protein concentrations on exposure to warmth.[15] Such lowered concentrations are those to be expected if, through slight vasoconstriction in the splanchnic area, the capillary pressure in the intestinal vessels is reduced and more fluid is absorbed to dilute the blood. Changes of this type are usually temporary, for with acute exposure to heat the water loss is greatly increased and may result in dehydration, so that later the opposite effects of increased hemoglobin, red cell and serum protein concentrations may be seen.[16] Quantitative calculation of the changes in the blood volume is not possible, since the composition of the circulating blood may be modified by the addition of abnormal blood from some reservoir such as the spleen. Up to the present time no valid evidence has been advanced of acute increases in blood volume exceeding 10 per cent of the normal value. In the later stages, when the rate of fluid loss has been much increased through sweating, the blood volume can probably be reduced 10 per cent, 20 per cent or more below the normal volume. According to Kopp and Solomon,[17] reductions in plasma volume of from 10 to 32 per cent are common.

In spite of such a reduction in blood volume, the cardiac output may be maintained through the other adjustments already discussed. However, this is attained only with difficulty, and any relatively slight additional stress may create inefficiency. It is for this reason that the maintenance of an erect posture, with the consequent tendency for blood to accumulate in the dependent lower limbs, may cause inadequate venous return to the heart, decreased cardiac output and fainting, particularly in a warm environment. Failure of cardiac output, whether produced by a postural change such as that just mentioned or by decrease in blood volume through dehydration, is generated by inadequate venous return. The danger of cardiovascular failure depends on the removal of the normal paths of heat transference; cooling of the body surface is no longer able to lower the temperature of either the heart or the brain appreciably, since blood cooled at the surface is not carried by the circulation all over the body. The most urgent necessity is, therefore, to maintain a normal blood volume and to do this without introducing the opposite hazard of hydremic plethora.

The reactions to moderate heat maintained for a long period differ considerably from those of the acute reaction. Dilatation of the cutaneous vessels is still in evidence, though of a lower order. It is, however, extremely improbable that compensatory vasoconstriction in the splanchnic area can be continued for days. Though some compensation by central vasoconstriction is possibly present, it is probably quite slight, except in the earlier stages, so that the alternative compensation of increased blood volume is utilized. This change is attained slowly, for there must be an increase not only in the salts and water of the blood but also in the total amount of serum protein, which exerts colloidal osmotic pressure and retains the fluid within the blood vessels. In addition, for full efficiency the total amount of red cells has to be increased, a process which takes even longer to reach completion. Though the increase in blood volume is attained slowly, it can be very large.[18] In three male subjects examined in Philadelphia one or more times in both winter and summer, the extreme differences in blood volume have been of the order of from 30 to 40 per cent in each subject, or about 1.5 liters. In all three subjects the smaller blood volumes have been observed in the winter and the larger in the summer. These differences were observed when care was taken to obtain the measurements during maintained cool weather in the winter and during maintained hot weather in the summer; the data therefore do not represent either summer or winter averages, nor probably the maximal changes obtainable under extreme conditions. It is indeed surprising that the changes were as great as those observed, since the subjects were all working in laboratories and in the winter spent most of their time indoors at temperatures of from 21 to 26 C. (70 to 80 F.).

In the earlier stages of warm weather, blood pressures may be slightly reduced and cardiac output is probably slightly increased if the subject is lying down. If the subject is standing, the superficial dilatation of cutaneous vessels favors pooling of the blood in the lower limbs, so that the reduction of cardiac output normally seen on standing is likely to be exaggerated and the difference in pulse rate between the lying and standing positions is likely to be large. Standing becomes a strain, and slight edema of the feet and ankles may be seen. Light work that involves standing may be performed very inefficiently. As the subject adapts to the warm temperatures, these disabilities disappear. Blood pressures become normal or supernormal; standing can be maintained not only with a normal but more commonly with a subnormal reduction in cardiac output and with a subnormal increase in pulse rate. Light work can again be performed efficiently. Probably a large factor in the attainment of such cardio-

13. Rein, H., and Rössler, R.: Die Abhängigkeit der vasomotorischen Blutdruckregulation bei akuten Blutverlusten von den thermoregulatorischen Blutverschiebungen in Gesamtkreislaufe, Ztschr. f. Biol. **89:** 237-248, 1929.

14. Schretzenmayr, A.: Die Rolle der mittleren und grossen Arterien bei der Regulierung des Kreislaufs, Klin. Wchnschr. **15:** 625-629, May 2, 670-674 (May 9) 1936. Bazett, H. C.; Scott, J. C.; Maxfield, M. E., and Blithe, M. D.: The Effects of Baths at Different Temperatures on Oxygen Exchange and on the Circulation, Am. J. Physiol. **119:** 93-110 (May) 1937.

15. Barbour, H. G.; Dawson, M. H., and Neuwirth, I.: Water, Salt and Lipoid Accumulation in the Serum as a Preliminary to Sweating, Am. J. Physiol. **74:** 204-223 (Sept.) 1925.

16. Bazett, H. C.: Studies on the Effects of Baths on Man, Am. J. Physiol. **70:** 412-429 (Oct.) 1924. Barbour, Dawson and Neuwirth.[15]

17. Kopp, Israel, and Solomon, H. C.: Shock Syndrome in Therapeutic Hyperpyrexia, Arch. Int. Med. **60:** 597-622 (Oct.) 1937.

18. Sunderman, F. W.; Scott, J. C., and Bazett, H. C.: Temperature Effects on Serum Volume, Am. J. Physiol. **118:** 199 (June) 1938.

vascular adjustments is an increase in blood volume, so that any blood pooled in the legs during standing represents a smaller percentage of the total volume.

In order to test the rapidity with which these changes develop, experiments are in progress in which the subjects are maintained in an air-conditioned room under constant conditions differing from those normal to the season. These experiments are being carried on with the cooperation of Drs. J. C. Scott and F. W. Sunderman.[19] A General Electric air-conditioning unit is being used. An experiment of this type requires a great deal of time and the data are as yet comparatively meager. In an experiment started December 26 and lasting to January 2, two subjects entered the room kept at a "normal" temperature of 23.6 C. (74.5 F.) in the daytime and at 22 C. (71.6 F.) at night. After a day at these levels, the temperatures were raised to 32.5 C. (90 F.) during the daytime and to 31 C. (88 F.) at night. The humidity was maintained at approximately 36 per cent. The blood volume increased 6 per cent in one day, 10 per cent in two days and 25 per cent in five days and showed an ultimate increase of over 1 liter in each subject. Even so, the volumes were still below the summer maxima observed in these subjects. With the relatively acute changes in blood volume so induced there was little change in weight, other than that dependent on the alteration in blood volume; with an increase in blood volume of about 1 liter there was an increase in weight of 1 Kg. Changes in weight may indicate the development of changes in blood volume, but, owing to the numerous other factors that may influence weight, such agreement may be absent.

Not only was there an increase in blood volume but with this increase there also developed a greater stability of cardiovascular adjustments. Thus, in one subject the standing pulse rate was at first much more rapid than under control conditions, and the difference between lying and standing pulse rates was exaggerated. As adaptation developed, the standing pulse rate returned to its normal value and the increase in rate on standing was actually subnormal. In the other subject, who adapted more rapidly, the increase in pulse rate on standing was reduced even after one day's exposure to heat. The diastolic pressure observed when the subjects were lying down tended to rise progressively in both subjects. Entirely similar changes in both lying and standing pulse rates and in diastolic pressure in the lying position were observed in data obtained on one of these subjects and on a third subject in 1933 at different times of the year. The cardiovascular adjustments which developed in subjects after a stay of several days in a hot room resemble closely those found in the summer.

Not only is the capacity of adjusting to standing improved but the capacity to withstand dehydration by heat with less disability is also developed.[20] It has been shown by Vernon and Warner[21] that subjects are able to do light work in rooms at a high temperature with less change in rectal temperature, less change in pulse rate and somewhat less fatigue in the summer than in the winter. Such indications of greater fitness may well depend also on alterations in bood volume.

In view of the fact that the Englishman normally lives at relatively low temperatures, changes in blood volume to allow adjustment to higher temperatures may be particularly necessary in his adjustment to tropical or subtropical conditions. Some evidence that this may be the case is afforded by data on blood volume in English subjects in the tropics obtained by Barcroft and his associates,[22] for their data indicate an average increase of 38 per cent in blood volume in subjects traveling from England through the tropics. Incidentally their work, published in 1922, was the first to draw attention to the possible effect of a tropical climate on blood volume.

For full efficiency the total amount of red blood cells must also be increased. In the aforementioned hot room experiment both subjects had begun to increase their red cells at the end of five days, but in neither subject was the increase attained proportional to the increase in blood volume. The hemoglobin percentage was therefore reduced, a change not seen in Barcroft's subjects with longer exposure to heat in the tropics. In the aforementioned experiment evidence was obtained, though indirect and incomplete at the present time, that a temporary cooling of a subject for thirty hours might reverse the blood volume change and return it temporarily to normal, even though the subject returned to warm conditions. With the return to normal blood volume, cardiovascular adaptation to the hot conditions was lost. To obtain the beneficial effects of this mode of adaptation, it would seem essential to have the temperature maintained steadily at a high level.

These observations are reviewed in relation to physical therapy. In producing acute pyrexia, dehydration must be avoided as far as possible. By the use of humid conditions evaporation from the skin, independent of sweating, may be avoided, saving from 10 to 15 per cent of the total loss. This 10 per cent loss may make all the difference between a critical and a noncritical loss. Loss from sweating cannot be prevented. Deductions[17] that shock is more liable to occur in a moist atmosphere are erroneous; they depend on a failure to lower the temperature used in proportion to the higher humidity employed. Electrical methods of heating—whether by short or by long waves, by electric field or by electromagnetic field—are valuable but are not necessarily superior, in fact they may sometimes even be inferior to other methods of heating. For local application of heat electrical methods have many advantages in that they can be applied to localities almost inaccessible to other modes of heating. In addition they may allow some slight preferential heating of certain tissues according to the type of wave used. For the induction of general pyrexia they have no essential advantages; on the contrary, the maintenance of an adequate humidity is rendered somewhat more difficult. Methods employing moist air or a warm water spray may ultimately prove simpler, cheaper and more practicable.

Fluid given by mouth should be 0.2 or 0.3 per cent salt solution. Higher concentrations of salt are not indicated, since such solutions are adequate to replace loss of salt in the sweat. Should vomiting occur, replacement should be by the intravenous route and

19. Bazett, H. C.; Scott, J. C., and Sunderman, F. W.: Cardiovascular Changes in a Hot Room, Am. J. Physiol. **118:** 11 (June) 1938. Sunderman, Scott and Bazett.[15]

20. Bazett, Scott, Maxfield and Blithe.[14]

21. Vernon, H. M., and Warner, C. G.: The Influence of the Humidity of the Air on the Capacity for Work at High Temperatures, J. Hyg. **32:** 431-463 (July) 1932.

22. Barcroft, Joseph; Binger, C. A.; Book, A. V.; Doggert, J. H.; Forbes, H. S.; Harrop, G.; Meakins, J. C., and Redfield, A. C.: Observations upon the Effect of High Altitude on the Physiological Processes of the Human Body, Carried Out in the Peruvian Andes, Chiefly at Cerro de Pasco, Phil. Tr. Roy. Soc. London. **221B:** 351-480, 1922.

then physiologic solution of sodium chloride with dextrose may be employed. Hypertonic saline solution is contraindicated.

Cardiovascular failure develops through inadequate venous return and is accompanied by restlessness. Since inadequate filling of the cardiovascular bed is the primary cause, a blood volume raised initially above the normal value is of great advantage. This may be attained by exposing the subject to mild heat continuously for a few days in advance of treatment. The gain derived depends on an increase in the total amount of serum protein (normal concentration in an increased volume of plasma) which renders fluid retention in the vessels easier. The larger blood volume allows dilatation of cutaneous vessels with less central vasoconstriction. Intravenous infusion of acacia should also be advantageous. By the previous use of such means to increase blood volume or the employment of acacia at the start of treatment it should be possible to extend treatment to patients at present considered poor risks.

During treatment it is desirable to raise the body temperature with as little increase in brain temperature as possible, except perhaps in dementia paralytica. The common practice of keeping the face cool is therefore warranted, but with any such cooling the temperatures that are applied to the rest of the body must be intensified. For such cooling, or for cooling the whole body in an emergency, applications of lukewarm water under conditions favoring evaporation are indicated rather than of ice, for the latter causes superficial vasoconstriction and prevents the cooling extending to the deeper tissues.[23] For the same reason, fluids given by mouth should be at room temperature and not iced. Iced fluids are probably less readily absorbed. Intravenous infusions should be given at room temperature under conditions of high fever with failing circulation.

The possibility of extending hyperpyrexia treatment to a larger group raises the question of the probable effect of such temperature changes on patients with hypertension. In the two subjects investigated experimentally in a warm room, the changes in blood pressure were not great; none the less, the general effect of the warm room was to cause a rise, not a fall, in pressure. Thus the average systolic and diastolic pressures of the two subjects were as follows: on the first control day, lying 107/64, standing 115/91; during the first two days of warmth, lying 112/62, standing 115/86; during the fourth and fifth days of warmth, lying 107/64, standing 125/86, and during the first day and a half after a return to cool conditions, lying 112/69 and standing 124/87. Adaptation to the warm room caused a rise of pressure on standing; return to cooler conditions did not cause any immediate return to a normal blood pressure level; on the contrary, there was some evidence of a temporary further increase in pressure. A rise of systolic blood pressure of this order (10 mm.) has no great significance except that it is likely that such an increase would be grossly exaggerated in a hypertensive subject and that the change then might be very significant.

23. A recent report by E. B. Ferris Jr., H. A. Blankenhorn, H. W. Robinson and G. E. Cullen (Heat Stroke: Clinical and Chemical Observations on Forty-Four Cases, J. Clin. Investigation **17**: 249-262 [May] 1938) indicates that immersion in iced baths gives more effective cooling than does wetting with moist cloths in the air current of an electric fan. The greater effectiveness may depend on the utilization of a larger proportion of the surface in the cold bath. Observations comparing the relative value of cool water at about 25 C. (77 F.) and of iced water in baths under comparable conditions would be of interest.

Reactions of this sort may be concerned with the demonstrable fact that there is a great exacerbation of symptoms in hypertensive cases both in early summer and in the early fall—at times when there are abrupt changes in the external temperature.[24] Whether temperature changes are associated with considerable alterations in blood pressure in such hypertensive subjects cannot be properly tested in the laboratory, for such exposures to heat and cold may possibly be dangerous. On the other hand, preliminary exposure to mild heat would probably reduce the risk of frank hyperpyrexial treatments so that such preliminary exposure to moderate heat would be justified in cases in which it was to be followed by real hyperpyrexia. In this way, with adequate study, advancement might be attained not only in the practice of physical therapy but also in the knowledge of hypertension and its dangerous exacerbations. One must assume tentatively that the difficulties likely to be experienced on cooling after prolonged heating would depend on the initiation of generalized superficial vasoconstriction in the presence of a large blood volume, as well as on the existence of an excess of serum protein and of red cells (a rise in hematocrit is demonstrable in the normal subject) and on a consequent increase in blood viscosity during the return of the blood volume to normal.

Such difficulties might be avoided by bleeding as a prophylactic treatment. It may be that in this way bleeding, as utilized so generally in olden times, obtained some of its popularity, for it was common to bleed according to the season. For instance, in Richard the Second, Shakespeare makes King Richard say "The doctors say this is no month to bleed." On the principles here advanced, bleeding would appear most justifiable in the fall. The older physicians seem to have agreed that it was most beneficial in the spring. In this they followed Hippocrates, who advised (VI aphorism 47) "Such as are benefited by bleeding or purging should be purged or bled in the spring." Bleeding in the fall was, however, also common. Hare [25] noted the extreme value of bleeding when a plethoric individual suffered from dyspnea on sudden exposure to cold after a period at a warmer, Southern watering place.

CONCLUSION

It seems probable that significant changes in blood volume may be attained by steady, moderate but maintained rise in environmental temperature, while it is doubtful whether a fluctuating temperature can produce the same response. Changes in blood volume in both the upward and the downward direction are therefore controllable; they are associated with marked changes in cardiovascular reactions, and it should be possible to develop logical use of such changes in treatment.

24. Bazett, H. C.: M. Rec. **147**: 301 (April) 1938.
25. Hare, C. J.: Good Remedies Out of Fashion, Brit. M. J. **2**: 151, 1883.

Smallpox and Royalty.—Smallpox was one of the great scourges of the eighteenth century, though syphilis, typhoid fever, measles, diphtheria and influenza were close seconds. It is said that the mortality ratio from smallpox was 50 per cent, there being 60,000 deaths in one year from that disease. . . . Louis XV of France died of it in 1774, as had Mary, queen of England, in 1694. Most of the court beauties, even the Princess Anne, were so pock marked as to spoil their fair skins.—Hurd-Mead, Kate Campbell: A History of Women in Medicine, Haddam, Conn., the Haddam Press, 1938.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 12, 1938

NORMAL NUTRITION

Knowledge of nutrition continues to advance so rapidly that few are able to keep sufficiently informed to know even the trends of investigation. This advancement has been chiefly by laboratory workers in biochemistry, physiology or animal husbandry and, to a minor degree, by those primarily interested in medicine. The contributions in periodicals have been so voluminous and have covered so many different phases of the nutritional requirements of vitamin, mineral, protein, carbohydrate and fat that the occasional student is bewildered when he attempts to apply practically any portion of the new information.

In a comprehensive review Boyd [1] emphasizes a fact stated by many other observers, "that the nature of the dietary reflects itself in many ways in the manner of life and in the level of health of the people." Ample investigative work supports his conclusion that "the physique or rate of physical growth is conditioned by the adequacy of the diet; that our innate propensities for growth are greater than our response usually indicates; and that our present standards of normality of growth should be considered as average under imperfect nutritional conditions rather than optimum." Studies by other workers, as well as reports from the Health Division of the League of Nations,[2] indicate that deficiencies of vitamin D and of calcium are more frequent than are those of any other nutritional elements. Such deficiencies not only may result in a suboptimal physical growth [3] but are probably of still greater importance in the etiology of dental caries.[4] There is also an increasing amount of both clinical and experimental evidence that deficiencies of vitamin B_1 and occasionally other factors in the population of civilized countries, including the United States, may be more common than have been previously believed.

Simmonds,[5] in a recent article in THE JOURNAL, stated that nutrition may now be considered largely a problem of economics and education. The information that is now known and understood by scientists must be conveyed to the average citizen. The knowledge may be of great service if the masses can learn what is essential in balanced nutrition and come to desire it. Simmonds is probably correct when she suggests that "there is too much of a tendency to discuss nutrition in terms of vitamins, essential amino acids, carotene, thiamin chloride, ascorbic acid, nicotinic acid, dicalcium phosphate, calcium gluconate, units of various vitamins in foods and units of various vitamins needed daily by the individuals." To prevent unnecessary confusion, not only for the average patient but for the physician, the question of balanced nutrition must be discussed in terms of milk, meat, potatoes, carrots, oranges or cod liver oil. Such substances are within the radius of experience and knowledge of the average person. The results of laboratory investigations in the field of normal nutrition must be translated into simple common denominators if they are to reach those by whom they are most needed.

1. Boyd, J. D.: Changing Concepts of Normal Nutrition, Northwest Med. **37**: 71 (March) 1938; read before the North Pacific Pediatric Society, Portland, Ore., June 26, 1937.

2. League of Nations: The Problem of Nutrition, New York, World Peace Foundation, vols. 1, 2, 3 and 4.

3. Stearns, Genevieve; Jeans, P. C., and Vandecar, Verva: Effect of Vitamin D on Linear Growth in Infancy, J. Pediat. **9**: 1 (July) 1936.

4. Boyd, J. D.; Drain, C. L., and Nelson, Martha V.: Dietary Control of Dental Caries, Am. J. Dis. Child. **38**: 721 (Oct.) 1929. Boyd, J. D.; Drain, C. L., and Stearns, Genevieve: Metabolic Studies of Children with Dental Caries, J. Biol. Chem. **103**: 327 (Dec.) 1933. McBeath, E. C.: Experiments on Dietary Control of Dental Caries in Children, J. Dent. Research **12**: 723 (Oct.) 1932.

5. Simmonds, Nina: Recent Researches in Nutrition in Relation to Preventive Medicine, J. A. M. A. **111**: 1073 (Sept. 17) 1938. The Dietary History and Its Value in Dental and Medical Practice, Am. J. Digest. Dis. & Nutrition **4**: 497 (Oct.) 1937.

NINE YEARS OF RESEARCH ON DRUG ADDICTION

Studies on Drug Addiction,[1] supplement 138 to *Public Health Reports*, is the report of nine years' work under the auspices of the National Research Council with funds provided by the Rockefeller Foundation. The work represents close cooperation between the Research Council and the United States Public Health Service, under whose guidance the clinical studies that form a part of the volume were conducted. The American Medical Association early joined with the Committee on Drug Addiction of the National Research Council in publishing a small volume, Indispensable Use of Narcotics,[2] which was designed to put before physicians what was then known about the use of narcotics in medical treatment. It was hoped by education to keep this use at the minimum for control of pain and for comfort, as it was known that the careless administration of opium derivatives having liability to addiction is responsible for many of the habits contracted by addicts.

In the past it has always been difficult to study cerebral and other living responses of the nervous

1. Small, L. F.; Eddy, N. B.; Mosettig, Erich, and Himmelsbach, C. K.: Studies on Drug Addiction, with Special Reference to Chemical Structure of Opium Derivatives and Allied Synthetic Substances and their Physiological Action, Supplement 138 to Public Health Reports, Washington, D. C., Government Printing Office, 1938; price, 60 cents.

2. The Indispensable Use of Narcotics, by Various Authors, Chicago, American Medical Association; reprinted from THE JOURNAL, March 14 to June 6, 1931.

tissue. Recently, however, with the introduction of the encephalograph, a new technic has been provided for studying the living neuro-electrical reaction. At the United States Public Health Service Hospital at Lexington, Ky., a beginning has been made in this study by comparing the effect of some fifteen drugs related to the morphine molecule.

Studies on Drug Addiction describes the results of the research in progress since 1929. It discusses the addiction property of morphine particularly as a question of chemicopharmacologic relationship, since the committee's plan of a contribution to the problem of drug addiction conceives the possibility of separation by chemical modification of useful analgesic action and undesirable liability to addiction. To this end the project is a systematic attempt to ascertain (*a*) the relationship between chemical structure and pharmacologic action in morphine and its derivatives, (*b*) whether or not it is possible by chemical modification to dissociate the various pharmacologic actions characteristic of morphine, and (*c*) whether or not a synthetic substance can be obtained comparable to morphine in its analgesic action. The report contains a tremendous amount of data, since it describes the chemical properties, method of preparation and pharmacologic action of more than 300 compounds, most of which were made for the first time in connection with this work.

In the first section of the report, more than 100 derivatives of morphine are discussed. The conclusions indicate clearly that specific chemical modifications do not affect uniformly, either in direction or in degree, all the pharmacologic actions of an alkaloid of the morphine series. In the second section chemical pharmacologic relationships are discussed for more than 200 synthetic substances built up from phenanthrene, dibenzofuran or carbazol. Some of these, especially in the carbazol series, have exhibited a considerable degree of analgesic action in animals. All of the actively analgesic synthetic substances, however, have developed one or more undesirable side actions. The third section of the report describes the clinical studies which have been made in connection with this work, aimed especially at determining the liability to addiction of selected morphine derivatives. A practicable method of quantitative evaluation of the abstinence phenomena, the sine qua non of addiction, is described. Besides it is shown that different substances, differing in their chemical relationship to morphine, vary to some extent in the character and duration of their dependence satisfaction power in known addicts. Clinical pharmacologic studies on nonaddicts are also under way and some of the results obtained are given.

The report has been carefully prepared, it is abundantly illustrated by diagrammatic representations of the chemical relationships involved, and each section is clearly and concisely summarized. Included with the report is a complete list of the previous publications of the units cooperating in the research. Pharmacologists, physiologists, chemists, physicians and all who are interested in the basal problem of the relation of chemical structure and physiologic action of narcotics must be familiar with this work.

THE SCOPE AND FUTURE OF PHARMACOLOGY

Recent contributions in THE JOURNAL[1] have reflected a growing concern in the United States over the status of pharmacology. Worldwide interest was demonstrated in this subject by the large attendance and vigorous discussion at a symposium on the scope and future of pharmacology, sponsored by the sixteenth International Physiology Congress at Zurich. In opening the symposium, Sir Henry Dale of London suggested that pharmacology would profit by following the trends of clinical opinion. Clinical interest has turned, he insisted, from the relief of symptoms to the control of causes; clinicians are more concerned now with etiology than with therapeutics. Pharmacologists might help greatly, according to Sir Henry, by orienting clinicians in the uses of such products as hormones to maintain a proper physiologic balance in the human being. Straub of Munich pointed out that pharmacology would probably always have the task of providing physicians with a rational background for the use of drugs. In this regard Starkenstein of Prague remarked on the diverse knowledge required of the pharmacologist in chemistry, physiology, clinical medicine and other fields. Grabfield of Harvard commented on the report of the special committee of the American Society for Pharmacology and Experimental Therapeutics, which recommended that teachers of pharmacology have professional medical degrees. In explaining how a conversation with Sir Henry Dale had led to the symposium, Heubner of Berlin referred to the wisdom of correlating teaching and research in pharmacology as closely as possible with other medical sciences.

Most of the discussion dealt with the teaching of pharmacology in relation to practical medicine. A broader point of view was developed by Leake from California. Defining the science as the study of the action of chemicals on living things, he suggested that its scope is indicated by its special problems and its future is predictable from the applications made of its findings. The special problems of pharmacology, he said, deal with (1) dose-effect relations, (2) the site of drug action, (3) the mechanism of drug action, (4) drug absorption and detoxification and (5) the relation between physicochemical properties and biologic action. Currently, he pointed out, the factual observations of pharmacology are being applied to the diagnosis and

1. David, N. A.: The Recent Graduate and Drug Nihilism, J. A. M. A. **106**: 405 (Feb. 1) 1936. David, N. A., and Emerson, G. A.: The Present Status of Research and Teaching in Pharmacology, ibid. **107**: 1599 (Nov. 14) 1936. DeGraff, A. C.; MacNider, W. deB.; Hayman, J. M., and Edmunds, C. W.: Symposium on the Teaching of Pharmacology, J. A. Am. M. Coll. **11**: 65, 70, 77, 83 (March) 1936.

prevention of disease in animals and human beings as well as to treatment, to agriculture (pest control and ripening of fruits), to public health (industrial toxicology and control of quackery) and to sociology (crime detection and control of drug addiction).

As emphasized recently, Professor Leake [2] maintained that pharmacology has a scope and future much greater than that indicated by its traditional relation to practical medicine. Whatever knowledge is contributed by pharmacology regarding the action of chemicals on living things may be used by the alert and imaginative physician in accordance with his judgment to promote the welfare of his patients. The teaching of medical students in this spirit might do much to improve the resourcefulness and increase the responsibility of physicians with regard to the use of drugs.

2. Leake, C. D.: Prolegomenon to Current Pharmacology, Univ. California Publ., Pharmacol. **1**: 1 (March) 1938.

Current Comment

MEDICAL SUPPLEMENTS IN THE PRESS

Two county societies have recently collaborated in the publication of medical supplements in their local newspapers. On October 25 the Nassau County Medical Society, Mineola, N. Y., published a health section of forty-eight pages in the Nassau *Daily Review-Star* and on October 30 the Wayne County Medical Society, Detroit, published its second annual medical supplement in the Detroit *Free Press*. Both supplements were profusely illustrated and the editorial content was of a high order. Both were published in tabloid form with original front-page layouts, the Nassau society using an interesting arrangement of photographs and the Wayne County society using an original drawing. Not only were the activities and functions of the local societies and the American Medical Association described in both supplements but a wide variety of interesting articles on all phases of medicine and health were used. Such supplements, properly prepared—as these two were—provide an excellent medium of public education in matters vital to health of the individual.

A SYMPOSIUM ON MENTAL HEALTH

The needs of the mentally sick of American communities cannot apparently be met by continuous expansion of public hospital facilities. The answer to the problem from the point of view of medical requirements and economic feasibility must lie in the development of auxiliary community services and measures of an ameliorative, preventive, educational and social nature. In an effort to bring the scientific, educational and social resources of the nation to bear on a coordinated, fundamental and more effective attack on the whole problem of the cure, control and prevention of mental illness the American Association for the Advancement of Science, through its section on medical sciences, proposes to hold a symposium on mental health at its winter meeting in Richmond, Va., in December.[1] This symposium will occupy three consecutive days, beginning December 28 and ending December 30. Unlike the usual scientific meeting, the majority of the communications will not be read at the meetings but will be published in advance and used as a basis for discussion, thus freeing the conference period for extensive consideration of the more vital issues. It may well be that problems of mental health are the most serious of all the medical problems which now concern the nation.

1. Soule, M. H.: The American Association for the Advancement of Science, Science **88**: 302 (Sept. 30) 1938. News Comments, Mental Hygiene, October 1938.

MICROSCOPY

Progress in the mechanical development of the microscope has reached such a stage that the inner structure of bacteria, small colloids and many viruses can be readily visualized.[1] The availability of an instrument of such quality will doubtless lead to the determination of the causes of diseases which have heretofore resisted identification. Furthermore it is likely that within a short time further technical developments in microscopy will open up new avenues of research. In addition, fluorescence microscopy has already, at least in an experimental way, gained a foothold in establishing the presence of tubercle bacilli in the tissues.[2] These developments, which are generally termed pure science, are likely to lead to still greater strides in medical science.

1. Das Uebermikroskop, Chemiker-Zeitung **62**: 561 (Aug.) 1938.
2. Haitinger, M.: Fluorescenzmikroskopie, Chemische Novitäten **1**: 1 (July) 1938.

DENTAL CARIES IN SIBLINGS

Recently Klein and Palmer [1] analyzed the dental status of two groups of children, one designated as caries immune and the other as caries susceptible. The study was particularly related to the incidence of caries in siblings. Basic data were obtained from examinations of 4,416 elementary school children who comprised 94 per cent of the entire enrolled grade school population of a small urban community (Hagerstown, Md.). Carious lesions were determined by trained dental officers. By means of certain criteria carefully outlined, 357 of the children were designated as caries immune and 270 as caries susceptible. Two immune siblings were observed in each of twenty-seven families and two susceptible siblings in each of thirteen families; three immune were found in each of two families and three susceptible in three families, and four immune were observed in one family. In each of two families one immune and one susceptible were found. Analysis of the results indicates that siblings of those susceptible to caries have more than twice as much caries in both the permanent and the deciduous teeth as do siblings of the immune. These conclusions were based on a sufficiently large number of cases to constitute statistically valid evidence, and the authors therefore believe that the existence of familial resemblances in carious experience of siblings is definitely established. No specific explanation is offered for the observed familial differences.

1. Klein, Henry, and Palmer, C. E.: Familial Resemblance in the Caries Experience of Siblings, Pub. Health Rep. **53**: 1353 (Aug. 5) 1938.

ORGANIZATION SECTION

THAT PHILADELPHIA OBSTETRIC CASE

Recently many newspapers have commented on the report of a case in which a woman in Philadelphia gave birth to a child prematurely without medical assistance at the time of birth. Apparently a police report on the case said:

> Woman was out of funds; hence unattended delivery. Nothing suspicious.

The Philadelphia *Record* says this indicates

> Plenty of grounds for suspicion concerning the medical profession's responsibility and adherence to its own rules of ethics, about which the public hears so much.

According to the newspapers, a policeman called six physicians in the neighborhood and all refused to leave their homes at 7 a. m. on a charity case. The baby, it appears, was born dead. This case was made the basis of a column by the Philadelphia *Record*'s columnist, Mr. Jay Franklin, who has not neglected a single opportunity in recent months to assail the medical profession and to exalt collective medicine.

He concludes his column with the statement:

> I think it is up to Dr. Fishbein to make a swift investigation of the facts as to this incident in Philadelphia and to make those facts public.

Mr. Westbrook Pegler in his column says:

> Not to find fault too readily with the press work on the story of the destitute Philadelphia woman, I suggest, nevertheless, that the account left untold facts which were no less important than those it did tell. How came the patient not to have made arrangements for attendance in an expected emergency? Was it any fault of hers or the husband's, or can it be that Philadelphia simply does not give such assistance? If free care is available is it, then, the duty of the doctors and social service workers to go about scouting for patients? And, finally, what about the six doctors? What were their reasons, and did any one even trouble to ascertain whether they were already occupied with more forehanded patients or, perhaps, thought it was a case which the ambulance service should take in its stride?

THE FACTS IN THE CASE

Here are the facts in the Philadelphia incident as reported to THE JOURNAL: On Sunday morning, October 23, at 7 a. m., the patient was delivered of a six or seven months stillbirth at a rooming house to which she went only about an hour before. Her home address is not known, and she was in labor on arrival at the rooming house. She had previously been taken to two hospitals by a roomer and had been examined and refused admission at both hospitals because of not being registered in either as a patient. She was then returned to the rooming house. One of the roomers called the sergeant at the police station, who failed to call the district physician because he said he did not wish to disturb him on Sunday. The roomer then tried to reach five different doctors in the neighborhood. The first doctor was taking a bath at the time when his doorbell rang, and when he answered the doorbell no one was there. He reported that he had not taken care of an obstetrics case for thirty years. The second doctor, who was a specialist in diseases of the eye, was asleep and did not answer the doorbell. The third doctor who was called does not practice obstetrics, but he offered to send an ambulance for the patient. This offer was refused. The sergeant at the police station telephoned to a hospital and the assistant chief resident offered to call on the woman if the police would send a car. On his arrival at the rooming house, the resident found the patient and the dead infant, which had delivered spontaneously. He administered treatment to the mother and left with instructions to call the hospital if further treatment was necessary. This patient refused to answer any questions, made no statements and disappeared one week later. It appears that there are ten hospitals within a distance of from three blocks to one and one-half miles from the place in which this delivery occurred. For some reason it is now impossible to secure statements at the rooming house concerning the incident.

A CASE IN CHICAGO

Physicians know that such incidents occur in all large cities and there seems to be considerable doubt as to whether the condition could be improved under any other system of medical care than that which now prevails. In Chicago during the month of October 1936 the following incident occurred: A Negro girl aged 17, not married, gave birth to a child prematurely at the seventh month in a rooming house which was within a mile and a half of seven hospitals. The coroner's examination indicated that the child had died of exposure following birth. In this instance the patient stated that her progress had been normal throughout her pregnancy. A week before the birth of the child she had visited a Negro hospital in the vicinity and was advised to return within a few days for additional treatment. The child was born spontaneously. A caretaker in the rooming house, finding the child born, called the Negro hospital and was informed that it was impossible to send a physician and that the patient should call the Cook County Hospital. She called the Cook County Hospital and was told that it was impossible for them to take care of the patient because she had been registered in the Negro hospital. At the Cook County Hospital she was told to call the police station. She called the central police station, which transferred the call to the Wabash Avenue station, which informed the woman that it was impossible to give attention since the baby was already born. A call made to an emergency relief agency resulted in a statement to the effect that it would be desirable first to file a regular application. Obviously in this instance several public agencies failed simply because of ignorance of those answering telephones of the fact that the Chicago Maternity Center, the Chicago Lying-In Hospital and other agencies within the vicinity could have provided service on request. Incidentally, in this case the first physician who was called on the telephone responded immediately but unfortunately arrived after the birth of the child.

NO PROTECTION AGAINST IGNORANCE

A study of the facts in the Philadelphia case will reveal to any one that the physicians of the community were certainly not at fault. There can be no protection

against ignorance. Neither can there be protection against the unwillingness of the public to cooperate with available agencies whether governmental or private. Mr. Franklin and the Philadelphia *Record* have again done serious harm to the repute of the medical profession by publishing an attack without adequate investigation. The least that they can do now is to publish the facts.

AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

The Washington County (Iowa) Medical Society analyzed and compiled the facts developed in the Study of Need and Supply of Medical Care for that county and drew the conclusions from the facts so thoroughly that the society's summary is published as received.

Washington County, Iowa

Washington County, situated in the southeastern part of Iowa, has an area of 576 square miles and a population of approximately 20,000. The county seat, located near the center of the county, has a population a little short of 5,000. There are eight other towns in the county, besides several villages. Physicians are located in seven of the towns, there being nineteen physicians in the county in active practice, seventeen in general practice and two in special practice.

Washington County is essentially a farming community, three fourths of the population living on farms or in cities under 1,000. There are, however, several industries. The Maple Crest Hatcheries at Wellman employ, during the season, from 150 to 250 persons. Brighton has a canning factory which employs a number of people during the harvest season. In Washington the American Pearl Button factory employs about 150 persons, the McCleery Calendar factory from fifteen to thirty-five, the Continental Telephone Company from twenty-five to thirty, the Iowa Southern Utilities Company from twenty-five to forty and the Washington school system employs about sixty-five teachers and town and rural schools employ another 160.

Washington County was settled to a large extent by people from Ohio, Pennsylvania and Illinois. There are Bohemians, Swedes, Norwegians, Hollanders and people of Welsh extraction but comparatively few foreign born people in the county. The Negro population of Washington County amounts to less than 0.25 per cent of the population.

As to the economic conditions in Washington County, it is said that approximately 75 to 80 per cent of some 2,500 farms in the county are farmed by tenants. A considerable number of these are sons or sons-in-law of the owners. In addition, according to the Farm Security Administration, seventy-eight rural rehabilitation loans have been made during the last three years in this county.

The Relief Office states that there are eighty-eight families on WPA, fifty families (283 individuals) receiving direct relief from the FERA and approximately eighty-two families and twenty-nine single persons (aggregating 346 individuals) receiving relief from the county. It is estimated that these families will aggregate approximately 800 individuals. In addition, there are between 375 and 400 persons receiving old age pensions.

THE CARE OF THE INDIGENT

For several years the Washington County Medical Society has had an exclusive contract with the board of supervisors for the medical care of the indigent of Washington County. The laws of Iowa require that this arrangement provide full medical care. Therefore quasimedical sects may not participate in such an arrangement.

During the winter of 1930 a member of the Washington County Medical Society suggested to the Medical Economics Committee of the Iowa State Medical Society that a standard fee bill be prepared which could be used as a basis for negotiations for county medical societies throughout the state. This was done and the standard fee bill was adopted by the house of delegates of the Iowa State Medical Society in May 1931. This fee bill has since been used extensively for the purposes for which it was intended.

The contract which the Washington County Medical Society has had with the board of supervisors provides that bills shall be submitted monthly after having been sanctioned by the welfare officer, based on this accepted fee bill, and payment shall be made to the society at a percentage fee of this contract. In this county this amounts to about 54 per cent. The money is prorated to the members of the society in the same proportion that the total of his bills bears to the amount of money on hand, after dues to the state society for each member and the expenses of the society for meetings and other projects during the year have been paid. This work takes about 6 per cent of the total amount of money received. The members therefore receive in cash approximately 50 per cent of the fees of the bills.

By arrangement with the board of supervisors and the relief office, the annual quota to the University Hospital being fifty-three, an effort is made to fill this quota with patients who cannot readily be taken care of in the local county hospital—that is, persons with disease of the prostate, rectal cancer, some complicated fractures, and so on. The board of supervisors has directed the relief office not to send any patient to Iowa City who can be efficiently cared for at home, unless it is done at the doctor's request.

In addition to this contract for medical care the society has a supplementary contract for the care of surgical patients. This is based on 30 per cent of the standard fee bill, or $40.50 for a major operation. This includes all care of the patient while in the hospital. This arrangement has been extremely satisfactory over a period of years to the medical society members, to the board of supervisors, to the welfare worker and to the people concerned. During the year 1937 the society was paid, for surgery, the sum of $1,308 and for general medical care—which includes obstetrics, fractures and minor surgery—the sum of $3,286.69.

WELFARE AND RELIEF AGENCIES

Under authority of the statutes of Iowa the Board of Supervisors has, for several years past, maintained a relief office under the charge of a competent investigator. It is the duty of this officer to investigate the financial standing of all persons who desire commitment to the state hospital or to patients who desire medical or hospital care within the county. The law provides that, if patients committed to the state hospital, exclu-

sive of obstetric and orthopedic patients, cannot be received within thirty days, the board of supervisors shall provide needed care within the county (if such care is available, as some counties do not have hospitals).

The county medical society and the welfare officer are able, and always have been able, to work without friction. A definite willingness to cooperate for public good assures this.

HOSPITAL PROVISIONS

The Washington County Hospital holds the record of being the first such hospital ever to be established in the United States and its record and reputation have been the means of establishing similar hospitals in several other communities and other states.

The Washington County Hospital, opened in 1912, is the property of the county and is maintained, above income, by a general tax spread throughout the county. The statute provides that all residents of the county are to be furnished such hospital aid as they may need irrespective of ability to pay. No resident of the county is denied hospital care for financial reasons. Patients with active tuberculosis and patients with communicable diseases are not cared for in the hospital.

The law further provides that the county shall provide for the care of patients with active tuberculosis in public or private institutions within the state at the rate of $65 a month. At the present time Washington County is paying for the care of such patients the sum of about $2,100 a year. Patients with communicable diseases are cared for in the homes but may, if complications so indicate, be taken to the University Hospital. For the year 1937 the Washington County Hospital had provision for twenty-eight adult patients and ten babies. There were during that year 671 pay or part-pay patients in the hospital (for 4,393 days' service), 153 public charges—those referred by the welfare office (for 1,719 days' service) and forty-seven free patients—those persons unable to pay their bills but not county charges (402 days' service). The hospital charges vary from $3 a day for ward rates to $5 a day for private rooms. The daily average bed occupancy in the hospital was 19.6. The hospital maintains a well equipped x-ray department and laboratory department for chemical, bacteriologic and serologic examinations.

The hospital is standardized by the American College of Surgeons, being one of two hospitals in the state of Iowa with a bed capacity of less than fifty so standardized.

QUOTA SYSTEM AT UNIVERSITY HOSPITAL

The statutes of Iowa provide for sending indigent patients to the University Hospital for medical and surgical care. The purpose of this law is twofold: (1) that people of this class, that is, those unable to pay for their care, shall receive competent attention and (2) that a sufficient amount of clinical material may be available for the purpose of teaching in the medical college. More than 85 per cent of the patients in the University Hospital are in this category. The state legislature appropriates the money to the university for this purpose, this money being raised by a 0.3 mill tax on the assessed property values of the state.

The university authorities estimate from the known daily costs per patient at the University Hospital the number of patients who may be taken care of during the current year from the known amount of income which this levy will produce. Quotas for each county are then assigned in the proportion that the population of that county bears to the general population of the state. For the state of Iowa during the year 1935 this 0.3 mill tax levy raised $900,000, taxable value for the state that year being $2,984,713,042. For the same year the taxable value of Washington County was $26,562,315 and the 0.3 mill levy raised $7,968.70. For that year we were allowed seventy patients in the University Hospital, which made the average cost per patient $113.80. This estimate is not strictly correct, as the patients who returned during the period for which the commitment is valid are also charged against this fund, which makes the actual per capita cost in the neighborhood of $75.

Obstetric and orthopedic patients are not charged against the quota, the reason for this being that usually these patients demand early attention and cannot wait for court assignments, and also to assure a sufficient amount of clinical material for these departments. Owing to the fact that the legislature has decreased the appropriation, it has been necessary to reduce the quota applicable to the counties, and the quota for Washington County for the current year is fifty-three. Counties are allowed a 10 per cent excess over the quota, if needed.

WASHINGTON COUNTY MEDICAL SOCIETY

The Washington County Medical Society is an old organization. The exact date of organization is not on record but we do know that it was functioning in 1853. For the last thirty-five years it has been an extremely active society, embracing in its membership every practicing physician in the county.

Through the activity of this society the Washington City Hospital was established in 1907. In 1908 the legislature of Iowa authorized the construction and maintenance of county hospitals. This society immediately took advantage of the law and through its activity the Washington County Hospital was opened July 15, 1912. This hospital has filled a very definite place in the county and to date more than 17,000 patients have been cared for, which almost reaches the number of people living in the county.

Through the efforts of this society a health unit was established in Washington County in 1924—the first county health unit in the state of Iowa. For the past eight or nine years the society has held monthly meetings, at which time men of ability within a radius of 150 miles, including some from Chicago, have appeared before the society for discussion of subjects on which they were well qualified to speak. In addition the society has conducted several postgraduate courses.

A third of a century ago there were thirty-three practicing physicians in Washington County. Now there are seventeen in general practice. These seventeen now do more work, do better work, and do it easier than did twice the number in the earlier days. With telephones, automobiles and good roads, the residents of this county are receiving better attention and receive it more promptly than ever before. The character of practice has changed. A third of a century ago there was but little office practice. Most of the work consisted of home visits by the doctor. Now office work has increased because people are able to come to the doctor, requiring less time of the doctor away from his office. With the facilities of the hospital, serious medical cases, practically all surgical cases, and 33 per cent of the obstetric cases are taken care of in the hospital.

VENEREAL DISEASE CONTROL

For the past two years the director of the health unit has taken an active part in education concerning the incidence and treatment of venereal diseases and, as a part of his work, has done some treatment to properly certified patients. It is the plan of the Washington Medical Society, as directing the county health unit, to provide for the establishment of a demonstration unit in this county for the purpose of establishing and maintaining adequate measures for the prevention, treatment and control of syphilis. This plan implies education concerning the incidence of syphilis and possibility of its control and the necessity of permitting tests to be made and securing proper treatment when the disease is present. Plans for this project are now in the making and a copy will be filed with this report at an early date.

PREVENTIVE MEDICINE

Following the meeting of the American Medical Association in Chicago in 1924, toxin antitoxin was obtained from Abraham Zingher from the New York City Board of Health and was administered to pupil nurses and others in Washington during July of that year. This appears to have been the first toxin antitoxin which was used in this part of the country. The Washington County Health Unit was first organized in the same year and through all the ups and downs the health officer has continued educational campaigns looking toward immunization of school children against diphtheria and smallpox. Every year some immunization has been done and the school boards in two or three of the smaller towns have paid the local physician a lump sum to immunize all the children. Four or five years ago in Crawfordsville, 198 children of 200 were immunized. All together a goodly percentage of the children who are now in high school have been immunized. There remains a considerable amount of work to be done among younger children. However, not one case of diphtheria has originated in Washington County for ten years. During that period three cases have been brought in from the outside.

The members of the Washington County Medical Society have, for a number of years, been quite active in preschool examinations, in summer roundups and in 4-H Club examinations. Each year prior to the state fair a large number of boys and girls are examined in order to find the best one of either sex to send to the state fair. As the health unit appears to be more firmly established than ever before, we look forward to a much greater number of children to be immunized as time goes on. The value of health work in 4-H Club examinations cannot be easily estimated, but it is recognized by the local county medical societies that it is an important part of their work, and work is cheerfully and willingly done.

Typhoid fever is practically unknown in Washington County. A few cases of undulant fever have been found during the past few years.

COUNTY TUBERCULOSIS ASSOCIATION

In 1936 a member of the society was asked to head the work of selling Christmas seals in the county. The work was accepted on two conditions: that (1) the organization should be county-wide and all money collected should go through one office, and (2) the doctor mentioned should select the executive committee. This was acceded to. During the winter of 1936 the groundwork was laid in preparing an effective organization which would be able to function the full year. The definite plan was that the large percentage of the money should be used for the good of the people of Washington County and all of it for tuberculosis work. None of this work has ever been done before. Through the cooperation of the school teachers of the county and the parent-teachers association in Washington a good start was made. Through the work of this same physician the state tuberculosis association arranged to cooperate with the state board of health to employ a full-time physician and nurse assistants for tuberculosis work, and, further, if the local Christmas Seal committee put into the health unit a sum of money equal to $10 per thousand of the county population the state tuberculosis association would put the same amount to the credit of the state board of health. In counties having no health organization the $10 per thousand was to be sent to the state board of health. Then the state board of health would double this amount in money and services for work in the county.

In carrying out this plan a chest clinic was held in the Washington County Hospital July 15, 1937, at which time 103 patients were roentgenographed, these patients being persons who either had active tuberculosis or had been associated with persons who had active tuberculosis within the past five years. A second similar clinic was held Nov. 16, 1937, at which time eighty-seven roentgenograms were taken, and on July 15, 1938, a third chest clinic was held and 132 chest roentgenograms were taken. The plans of this association for the winter of 1938 are rapidly nearing completion. The same plan of education will be continued.

MATERNAL DEMONSTRATION UNIT

Beginning July 1, 1936, there was organized, under the supervision of the Washington County Medical Society, a maternal demonstration unit, to work in close harmony with the health unit. The two nurses, devoting full time to this, were Miss Nadeau and Miss Brouillette. The duties of these nurses were to visit all expectant mothers, with the consent of the attending physician, to give such advice and render such assistance as might be needed, to explain to the woman the necessity of medical supervision, and to urge that it be procured; also to assist the doctor at the time of delivery for those persons who are unable to provide nursing service.

The usefulness of this unit has steadily grown and on July 1, 1937, it was placed directly under the health unit; both units were supervised by a committee of the county medical society. The nurses in charge at present are Miss Pearl Olsen and Miss Aila Hiltunen. During the past year stress has been placed on the necessity of blood examination for syphilis. A very large percentage of blood examinations are now being made. In 1937 there were 335 babies born in the county, 111 of these in the Washington Hospital. Sixty-eight deliveries at home were attended by maternal demonstration nurses, and at fifty-one others other registered nurses were in attendance; that is, registered nurses were in attendance at 70 per cent of the deliveries, either in the hospital or at home, and practical nurses were in attendance at forty-five others. Thus, in 80 per cent plus of all deliveries advance preparations were made for assistance. This unit provides sterile packets containing basins, soap, gloves, gowns, sheets, towels, gauze and cotton, thus insuring that every delivery will be effected under septic conditions. Last year 316 of these packets were prepared. Doctors living near the

edges of the county are permitted to use them in their practice outside the county and if a packet is not used within sixty days it is resterilized. This accounts for there being more packets used than there were deliveries in the county.

In 1937 53 per cent of the expectant mothers consulted their doctor before the fourth month. In the first six months during the year 1938 this figure had reached 60 per cent. In 1937 69 per cent had consulted the doctor before the end of the sixth month. During the first six months of 1938 this had risen to 79 per cent. Not a single mother died in the county during 1937 from causes connected with childbirth.

HEALTH UNIT

The health unit was first organized in Washington County in 1924 with financial assistance from the Rockefeller Foundation. This unit has continued to date except for two or three intermissions due in the main to political reasons. The unit was reestablished early in 1936 and began operations July 1 of that year —now organized under provisions of the Social Security Act of 1935, whereby sums of money listed for health work in the county are doubled by funds from the Public Health Service.

This unit requires a medical director with public health training, a sanitary engineer and two nurses, one of whom confines her activities to the city of Washington. Dr. R. M. Sorenson was the first medical director, R. J. Schliekleman the engineer, Miss Laura Einspahr city nurse, and Miss Stella Jorpeland county nurse. The duties of the engineer include investigation of the water and sewerage supplies of all schools and public buildings in the county, advice concerning lighting, heating and seating of schoolhouses, advice to town councils relative to water and sewerage problems, and administration of milk ordinance in Washington. The duties of the nurses are visiting various schools, inspection of children, home visits where indicated, and educational procedures. The medical director's main duty is education in health problems, including the use of preventive measures against communicable diseases, oversight of quarantine, and general assistance to all the doctors in health problems. The influence and activity of this health unit have continued to grow. The present director is Dr. D. C. Barrett and the county nurse is Miss Luther. The city nurse is Miss Jeffrey. The engineer remains the same.

There are 104 county schools, two parochial schools and eight public schools outside Washington. In Washington there are six public schools and one parochial school—all of which receive health services and supervision as needed. The birth rate in the county in 1937 was 16 per thousand. The death rate was 11 per thousand. The infant mortality rate was 44 per thousand. There was not a maternal death due to childbirth during the year. There has not been a case of diphtheria originating in this county for ten years; three patients have come into the county after having contracted diphtheria during that period.

SYPHILIS

Plans have been made locally and submitted to the United States Public Health Service for approval to establish and maintain adequate measures for the prevention, treatment and control of venereal disease, as proposed in the Act of Congress S. 3290, an amendment to the Act of July 9, 1918, after section 4, chapter 15 (40 Stat. 886; U. S. C., Title 42, Section 25). The plan submitted provides for reasonable payment to members of the Washington County Medical Society for the treatment of syphilis; it provides that the director of the health unit may take specimens of blood from groups who voluntarily request such action, and that the doctors may be paid a reasonable fee for the taking of blood specimens of those requesting it and the specimens to be submitted to the laboratory of the Washington County Hospital for examination by the Kline test. Those specimens which are found to be 3 plus or 4 plus by the Kline test will be submitted to the state hygienic laboratory for further examination by the Wassermann or Kahn test. The director of the health unit will receive no fee for any work he does in caring for the foregoing.

Those persons found with positive evidence of syphilis will be referred to their family physician and if found to be county charges the doctor will be paid as already noted. The remedies to be used will be furnished by the state board of health. The plan suggests that the expense of the hospital, that is, glassware and antigen, be provided by the United States Public Health Service and that a small monthly stipend be paid so that the hospital may employ a maid to do some of the detail work and relieve the nurse technician from these duties. The Phalanx Club, an organization of young men in Washington, is encouraged to begin publicity for blood tests as soon as we receive approval from the Public Health Service. It is estimated that the sum of $1,000 will carry this plan forward to the end of this fiscal year, that is, June 30, 1939, payment to be made on the filing by the doctor of proper records and to be prorated according to the same plan as is in operation with the society contract.

SUMMARY

In the survey of the need for medical care in Washington County and the facilities available we draw these conclusions:

There are in active practice in the county nineteen well qualified physicians; two of them are in special practice, leaving seventeen for general practice. It is found that no person in the county is more than 8 miles from a physician, and it is possible for a physician to reach any patient within fifteen or twenty minutes, except for a few weeks in the spring when the dirt roads are almost impassable. Still, it is possible for a physician, in any condition of the roads, to get [with automobile or other conveyance] within 2 or 3 miles of any home. The very efficient work of the Washington County Medical Society assures competent physicians.

There are twelve nurses in the county for general duty—eight of them for full-time and four for part-time duty. The hospital organization and equipment are available to all residents of the county. There are 119 schools which are well supervised by the health unit. There are twelve pharmacists in the county, who cooperate quite well in matters medical. They do not, when asked to refer some one to a physician, insist on selling a "patent medicine." In fact, we have reason to believe that the sale of "patent medicines" in this community had decreased markedly in the past twenty-five years.

There are twelve dentists in the county who assure us that they do not refuse remedial dental work even if the patient is unable to pay. They do insist on pay for corrective dental work. We are told that not

25 per cent of the people avail themselves of the work of the dental profession and that 50 per cent of the school children need dental work. This is not the fault of the dental profession but it does show that the community needs much education as to the availability of dental services and as to the necessity of securing such services when needed. The county medical society furnishes adequate medical and surgical attention to the low income group, regardless of their ability to pay. The society members receive reasonable recompense for the care of the indigent. The educational work carried forward and the maternal demonstration unit are producing increasingly gratifying results.

Under direction of the society there has been conducted yearly for five or six years educational campaigns to have children protected against diphtheria and smallpox. This effort has attained considerable success, but still the percentage of protected children is too low. The next step in the near future is to attempt to immunize children between the ages of 9 and 24 months. The local Red Cross chapter has contributed $100 for this work.

The records show that the physicians of this county during the year of 1937 cared for in their offices or homes between 1,500 and 2,000 patients from whom no payment is expected.

The close cooperation of all the agencies interested in public health in the county—that is, the county medical society, the hospital, the health unit, the maternity unit, the tuberculosis association, the board of supervisors, the welfare officer and other interested groups, such as schools, Rotary Club, chamber of commerce, Farm Bureau and Red Cross—is necessary for the successful planning for public health, and as this procedure has been functioning for a sufficient length of time to demonstrate that the plan is good and that good results are now being accumulated there is no working at cross purposes by the agencies named or by groups in Washington County.

More and more people are learning to appreciate the medical services which may be given them. There are, of course, in the community a certain percentage of people who prefer the services of quasimedical practitioners and do not avail themselves of medical services. That is their privilege.

Reviewing all the facts as presented by this survey, the medical profession of Washington County feels assured that the medical services are adequate, that their acceptance is quite general, and that there is no necessity for any change in the application of the medical services available to the needs of Washington County.

OFFICIAL NOTES

HEARINGS BEFORE THE GRAND JURY IN WASHINGTON

In addition to the witnesses mentioned in recent issues of THE JOURNAL, the newspapers report the following persons as having testified last week before the Special Grand Jury in Washington, D. C.: Dr. Raymond E. Selders, medical director of the Group Health Association, Inc.; Dr. Richard H. Price of the staff of the Group Health Association; Drs. Allan E. Lee and Richard Stephen Hulburt, both of whom are said to have resigned from the staff of the Group Health Association several months ago; Rev. David D. McCauley, dean of Georgetown University Medical School; Drs. George B. Trible and Roy D. Adams, both of Washington, D. C., and Mr. and Mrs. William A. Anderson, who joined the Group Health Association, Inc.

SECTION REPRESENTATIVES TO THE SCIENTIFIC EXHIBIT

The following physicians have been appointed by the different sections of the Scientific Assembly as representatives to the Scientific Exhibit for the St. Louis session, May 15-19:

Practice of Medicine—Fred M. Smith, University Hospitals, Iowa City.

Surgery, General and Abdominal—Grover C. Penberthy, 1553 Woodward Avenue, Detroit.

Obstetrics and Gynecology—H. Close Hesseltine, 5841 Maryland Avenue, Chicago.

Ophthalmology—Georgiana Dvorak-Theobald, 720 Medical Arts Building, Oak Park, Ill.

Laryngology, Otology and Rhinology—Lee Wallace Dean Jr., Barnes Hospital, St. Louis.

Pediatrics—Arthur F. Abt, 104 South Michigan Avenue, Chicago.

Pharmacology and Therapeutics—Wallace M. Yater, Georgetown University Hospital, Washington, D. C.

Pathology and Physiology—F. W. Konzelmann, Temple University Hospital, Philadelphia.

Nervous and Mental Diseases—Roland P. Mackay, 8 South Michigan Avenue, Chicago.

Dermatology and Syphilology—Hamilton Montgomery, 102 Second Avenue S.W., Rochester, Minn.

Preventive and Industrial Medicine and Public Health—Paul A. Davis, 1436 Delia Avenue, Akron, Ohio.

Urology—R. S. Ferguson, 121 East Sixtieth Street, New York.

Orthopedic Surgery—F. A. Jostes, 3720 Washington Boulevard, St. Louis.

Gastro-Enterology and Proctology—Sara M. Jordan, 605 Commonwealth Avenue, Boston.

Radiology—Elwood E. Downs, 509 North Broad Street, Woodbury, N. J.

Application blanks for space may be obtained from the Section Representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast over the Blue network of the National Broadcasting Company each Wednesday at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).[1]

These programs are broadcast on what is known in radio as a sustaining basis; that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

November 16. Healthful Play.
November 23. Weather and Wearing Apparel.
November 30. Rest, Relaxation and Recreation.

1. Owing to program conflicts, there will be no Chicago broadcast of the network program. Instead, a recording of the program will be broadcast over Station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

WOMAN'S AUXILIARY

Illinois

The auxiliary to the Chicago Medical Society held its first general meeting of the autumn at the Chicago Woman's Club, October 5. The speakers were Dr. Robert H. Hayes, president, and Dr. Frank F. Maple, secretary of the Chicago Medical Society. Dr. Hayes spoke on "What Have We to Look Forward to in the Practice of Medicine?" and Dr. Maple on "The Value of the Auxiliary."

Missouri

The Cass County Medical Society and the auxiliary held a joint meeting at Belton recently. Dr. Ralph R. Coffey of Kansas City was speaker.

Fifty-seven members of the auxiliary attended the annual board meeting at Columbia September 20. The subject of the essay contest, "Highway Hazards," was chosen at this time. The members will attempt to make the essay contest in the public schools a state project.

The program for the Missouri auxiliary for 1938-1939, prepared by Mrs. A. H. Horne, chairman of the program committee, will have as topic for the year "The House of Medicine."

The twenty-sixth district auxiliary held its annual picnic for the doctors and their families at Arlington in August with forty people attending.

Utah

The auxiliary to the Utah State Medical Association held its annual meeting at Ogden September 1-3; more than 100 members attended. Dr. E. N. Neher, chairman of the advisory council of the auxiliary, was speaker at the board meeting September 1. At the opening meeting Dr. M. J. Macfarlane, president of the Utah State Medical Association, was the speaker.

At the luncheon meeting Mrs. J. W. Aird of Provo spoke on the "Doctor's Wife as a Legislator." The program of the general session was a round table discussion led by the Utah members of the board of directors of the Auxiliary to the American Medical Association, Mrs. L. S. Merrill, Mrs. L. J. Paul and Mrs. Henry Raile.

At a dinner with Mrs. W. M. Stookey presiding, socialized medicine was discussed by Dr. John Z. Brown and Mr. W. H. Tibbals. Dr. Milton J. Rosenau spoke on "Fads and Fancies of Preventive Medicine and Public Health" at an open meeting September 1.

At the general session, September 2, Dr. Alma Nemir spoke on "The Preparation of Teachers for the School Health Program" and Judge Reva Beck Bosone spoke on "Petty Crimes and Traffic Offenses."

Dr. Irvin Abell, President of the American Medical Association, spoke at the breakfast given by the auxiliary at the Ogden Country Club September 3. Mrs. C. L. Schields, president of the Utah Auxiliary, 1937-1938, and Mrs. W. M. Stookey, president for 1938-1939, presided at these meetings.

West Virginia

Reorganization of the Raleigh County auxiliary in southern West Virginia, with an active membership of thirty-five, makes a total of twelve auxiliaries in the state.

An essay contest on "How to Prevent Contagion" will be sponsored in the Fairmont schools by the Marion County Auxiliary.

Fayette County recently placed Dr. William F. Snow of New York on the program at New River College auditorium for a talk on "Syphilis."

A five dollar prize has been offered to the county having the largest increase in *Hygeia* subscriptions. Logan County has placed thirty-one in the schools; Cabell and Raleigh counties have pledged forty and thirty subscriptions respectively.

A special research project for the year is the compiling of the biographies of the past presidents of the state medical association from 1867 to 1938.

Mrs. C. C. Tomlinson of Omaha, National Auxiliary president, was honor guest and speaker at the meeting of the state executive board in Charleston October 11. This meeting was presided over by Mrs. Frank S. Harkleroad of Beckley, state auxiliary president. Sixty auxiliary members from all organized counties in the state were present at the luncheon.

MEDICAL ECONOMIC ABSTRACTS

POSSIBLE PROGRAM OF SICKNESS INSURANCE

A suggestion as to changes that may be proposed in social security legislation is contained in a discussion of "Three Years' Progress Toward Social Security" by Arthur J. Altmeyer, chairman of the Social Security Board, in the *Social Security Bulletin* (**1**:6 [Aug.] 1938), in which he says:

"One respect in which our social insurance system is not yet as complete as those of many European countries is in its failure to provide compensation for loss of income because of illness or disability. The Social Security Act attempts to prevent or alleviate some of the distress caused by illness through federal grants to the states which enable them to strengthen their public health services, to extend care for crippled children, and to provide for maternal and child health and for vocational rehabilitation of the physically disabled. Compensation for the enormous wage loss due to illness and disability would seem to be our most important next step toward security of income. The recent National Health Conference was invaluable as a means of clarifying many of the complex problems involved in establishing an adequate nationwide program of health protection and in suggesting alternative lines along which solutions may be sought.

"It would seem that compensation for periods of temporary illness might well be coordinated administratively, when it comes, with our existing insurance provisions. If, as seems likely, it develops as a federal-state program, the taxes necessary to finance the system might well be collected at the same time as unemployment insurance contributions and by the same agency. Payment of disability benefits, however, presents a distinct problem. For while unemployment compensation benefits are paid to workers who are unemployed but able bodied and available for work, disability benefits are paid to workers who are unemployed under exactly opposite circumstances, that is, because of inability to work. With workmen's compensation already in operation for a number of years in practically all states, it may be desirable to take advantage of the experience of these agencies in administering the new but closely related disability insurance payments. These problems must be explored at length and with regard for the corresponding need to expand social insurance or other methods of providing security against the costs of sickness care."

MEDICAL CARE PLAN ABANDONED IN WASHINGTON

We have been informed through a communication from Dr. Clarence A. Smith, editor of *Northwest Medicine*, that the plan described in the October 15 issue of THE JOURNAL, page 1475, on "Care for Social Security Clients in the State of Washington," "was abandoned in the spring of 1938 due to suspension of federal contributions and lack of state funds." Because of this lack of funds, care of the indigent has now been returned to the individual counties, and there is no longer any uniform plan of supplying medical service for the indigent, and the greater part of such service is rendered without pay by physicians.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Division Meeting at Wetumpka.—The Southeastern division of the Medical Association of the State of Alabama met at Wetumpka October 13 with the following speakers, among others: Drs. Jesse P. Chapman, Selma, "Evaluation of Diseases of the Colon"; Dan C. Donald, Birmingham, "Surgery of Undescended Testes with Special Reference to Torek's Operation"; Thomas M. Boulware, Birmingham, "Puerperal Sepsis"; Edgar F. Fincher and William A. Smith, Atlanta, "Diagnosis and Treatment of Brain Tumors"; David Henry Poer and Thomas S. Claiborne, Atlanta, thyroid diseases.

CALIFORNIA

Alumni Reunion.—The University of California Medical School will hold an alumni day November 18 with sessions at the San Francisco Hospital. Clinics will form a large part of the program, covering, among other subjects, pneumothorax, cerebral anoxemia, recent advances in treatment of acute coccic infections, dissecting aneurysm, use of iodine in toxic goiter and bronchiolitis in childhood.

Society News.—The program of the Los Angeles County Medical Association, November 3, was presented by the anesthesia section; the speakers were Drs. Douglas R. Drury and Arthur E. Guedel on "The Effect of Anesthetic Agents on the Liver" and "Postoperative Pulmonary Complications" respectively.——At a meeting of the Military Surgeons of Southern California November 3 Drs. John R. Paxton and Ambrose S. Churchill, both of Olive View, spoke on "Surgery in Tuberculous Patients" and "Extrapleural Pneumothorax" respectively.——The Alameda County Medical Association was addressed in Oakland October 17 by Drs. Charles H. DeVaul on "Glaucoma"; Daniel Crosby, "Medicine and Liberal Legislation"; Robert K. Cutter, Berkeley, "Use of Mixed Respiratory Vaccine," and Edith M. Meyers, Oakland, "Infection in the Newborn and Problems of Nursery Control."——The Los Angeles Society of Neurology and Psychiatry was addressed October 19 by Drs. Clarence W. Olsen on "Constructive Apraxia"; Hans von Briesen, "Removal of Lipiodol After Myelography," and Johannes M. Nielsen, "Delayed Paralysis of Peripheral Nerves Due to Indirect Trauma."——The Humboldt County Medical Society was addressed in Eureka October 6 by Drs. Perry A. Bonar, San Francisco, on urology, and Charles C. Falk Jr., Eureka, prostatic obstruction.

FLORIDA

Annual District Meeting.—The North Central Medical District Society held its second annual meeting in Gainesville October 27 at the Hotel Thomas. Dr. Thomas A. Snow, president of the Alachua County Medical Society, gave the address of welcome. In addition to officers of the state medical society, the following spoke:

Dr. Samuel C. Harvard, Brooksville, Cauterization of the Cervix.
Dr. Thomas H. Bates, Lake City, Intestinal Parasites Causing Surgical Conditions.
Dr. Walter J. Baker, Foley, Undulant Fever.
Dr. Edwin L. Scott, Ocala, Responsibility of the General Practitioner to the Crippled Children.

ILLINOIS

Death from Rabies.—According to the *Health Messenger*, a young woman in the village of Westville died September 17 from what the attending physician described as a typical attack of rabies. About four months previously the woman was scratched on the leg by a puppy that is believed to have been rabid at the time. Since the death of the woman, seven relatives who believed they had been exposed to rabies by the patient or the dog have taken the Pasteur treatment.

Chicago

Symposium on Air Conditioning.—A symposium on air conditioning for human occupancy will be presented in the auditorium of the Engineering Building, Chicago, 7:30 p. m. November 22 under the auspices of the Chicago chapter of the American Institute of Architects and some other organizations.

Society News.—Dr. Arcnibald L. Hoyne will address the West Side Branch of the Chicago Medical Society November 17 on "Management of Scarlet Fever."——The Chicago Medical Society was addressed November 2 by Drs. Max M. Peet, Ann Arbor, on "Surgical Treatment of High Blood Pressure" and Andrew C. Ivy, "Physiologic Aspects of the Surgery of High Blood Pressure."——The Chicago Tuberculosis Society was addressed October 20 by Drs. Paul H. Holinger on "Bronchial Obstruction Produced by Cardiovascular Disease" and Willard Van Hazel, "Problems in Chest Surgery."

Discussion on Health of the Business Executive.—The department of industrial medicine of Northwestern University Medical School is sponsoring a dinner meeting at the Blackstone Hotel November 15, at which the theme of discussion will be "Health of the Business Executive—A Disturbing Industrial Problem." Dr. Robert M. Daley, medical director, Equitable Life Assurance Society, New York, and Dr. Edgar Van Nuys Allen, associate professor of medicine, Graduate School of Medicine, University of Minnesota, Rochester-Minneapolis, will be the speakers. Mr. O. E. Mount, chairman of the board of governors of the department of industrial medicine, will preside. Dr. Irving S. Cutter, dean of the medical school, will be the toastmaster.

KANSAS

Personal.—Dr. Walter P. Stoltenberg, Kinsley, has been appointed health officer of Kinsley County.——Dr. Leonard S. Steadman, Junction City, has been appointed health officer of Geary County to succeed Dr. Robert J. Lanning, who recently resigned to enter private practice.

Society News.—Dr. James W. Shaw, Wichita, discussed "The Treatment of the Patient with Nervous Exhaustion" before the Sedgwick County Medical Society October 4; Dr. George F. Corrigan, Wichita, spoke October 18 on "Tophaceous and Pretophaceous Gout."——Dr. William Walter Wasson, Denver, will discuss "The Anatomy, Physiology and Mechanics of the Chest as a Basis for the Study of Chest Diseases and Their Classification" before the Wyandotte County Medical Society November 15. The society was addressed November 1 by Drs. Harold V. Holter and Lewis G. Allen on "Cancer of the Fundus Uteri and Adnexa" and "Radiation Treatment of Inflammatory Diseases" respectively. Dr. James A. Fulton presented a "Statistical Report of 50,000 Anesthesias" at the meeting September 20, and Dr. Mervin J. Rumold discussed "Treatment of Appendiceal Peritonitis."

MARYLAND

Personal.—Dr. Leo V. Schneider, chief resident physician to the Tuberculosis Sanatorium, Glenn Dale, has been appointed associate clinical professor of medicine at Georgetown University School of Medicine, Washington, D. C.

Testimonial to Dr. Cullen.—Dr. Thomas S. Cullen, professor of gynecology, Johns Hopkins University School of Medicine, Baltimore, will be guest of honor at a dinner November 19 at the Southern Hotel commemorating his seventieth birthday. A native of Bridgewater, Ont., Dr. Cullen graduated from the University of Toronto Faculty of Medicine, Toronto, in 1890. He served as chairman of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, 1914-1915, and has been a member of its Board of Trustees since 1929. He was president of the Southern Surgical and Gynecological Association in 1916. Dr. Cullen has contributed much to medical literature.

MASSACHUSETTS

Society News.—Dr. Abraham Myerson, Boston, addressed the Pentucket Association of Physicians October 13 on "Autonomic Pharmacology." Dr. Frederick W. O'Brien, Boston, addressed the society September 15 on "What X-Ray Therapy Can Be Expected to Accomplish."——Dr. Philip E. C. Manson-Bahr, London, addressed the Harvard Medical Society, Boston, September 27 on "Diagnosis of Fevers in General Practice."

Medicolegal Conference.—About 100 persons registered for the first conference of the Massachusetts Medico-Legal Society at the Mallory Institute of Pathology, Boston City Hospital, Boston, October 4-5. Plans are now being considered to make the conference an annual event with a three or four day program instead of the two day program in this year's session. The society voted at this meeting to affiliate with the American Medico-Legal Association. Additional information may be obtained from Dr. William H. Watters, 270 Commonwealth Avenue, Boston.

MICHIGAN

Gifts to University.—Included among recent gifts to the University of Michigan, Ann Arbor, are the following: $22,500 from the U. S. Public Health Service under the Social Security Act to be used for training public health personnel; $8,000 from an anonymous donor for the study of infantile paralysis; $2,000 from the National Foundation of Infantile Paralysis Research for Dr. Max Minor Peet to be used in prophylactic chemicals for combating epidemics; $2,750 from the Du Pont Company, Wilmington, Del., for fellowships; $1,000 from James G. Hayes, Pittsburgh, to be used by the regents at their discretion, and $9,875 in assorted fellowships, scholarships and research grants from eleven different donors, newspapers reported.

Kellogg Foundation Increases Budget for Health.—The W. K. Kellogg Foundation, Battle Creek, will spend $2,256,130 for health service and capital grants for new construction during the fiscal year 1938-1939, according to newspaper reports, almost doubling its allocation of $1,130,902.75 for the year 1937-1938. The capital grants are divided into four classes, schools, hospitals, camps and youth buildings, and include the University of Michigan graduate dental schools and rural rehabilitation for 600 schools, it was stated. The foundation also sponsors health work in seven counties of the state, supplying the directors in charge of the health program. The counties are Calhoun, Allegan, Barry, Branch, Eaton, Hillsdale and Van Buren.

MINNESOTA

Public Health Dramatized at Annual Meeting.—The thirty-second annual session of the Minnesota Public Health Association will be held at the Nicollet Hotel, Minneapolis, November 18, with the Hennepin County Tuberculosis Association acting as host. At the annual Christmas Seal dinner Dr. William W. Bauer, Chicago, director of the Bureau of Health Education, American Medical Association, will be the guest speaker with Dr. Sidney A. Slater, Worthington, president of the public health association, as toastmaster. "'Our Town' Learns About Tuberculosis" is the title of a play to be presented with the following cast: Dr. Bauer, Miss Mable Johnson, R.N., and Miss Mary Lee, R.N. The skit illustrates how a school tuberculin testing program is sold to a community. Dr. Herman E. Hilleboe, St. Paul, director of the tuberculosis division, state board of health, will review the historical development of the fifteen public sanatoriums in Minnesota. Honor will be bestowed on the pioneer leaders in the establishment of the sanatoriums and life membership in the association will be conferred on them. Distinguished Service Christmas Seal Awards for 1937 will also be presented.

MISSOURI

Society News.—The St. Louis Medical Society was addressed October 4 by Drs. Anthony M. Tripodi on "Comparative Results of Partial Excision of the Pancreas with the Scalpel, Actual Cautery and Electrical High-Frequency Knife." A symposium on cannabis was presented by Charles Benjamin Holman, D.D.S., and Drs. John Auer and Lee D. Cady.——Dr. Virgil Holland Moon, Philadelphia, addressed the Kansas City Academy of Medicine October 14 on "Shock: Its Mechanism—Pathology and Early Diagnosis." The academy was to be addressed November 11 by Dr. Shields Warren, Boston, on "Pathology of Diabetes Mellitus."——At a special joint meeting of the medical societies of Jefferson, Franklin and St. Louis counties in St. Louis October 21 Drs. Oscar F. Bradford, Columbia, and Paul R. Fletcher discussed "Various Phases of Preventive Obstetrics and Pediatrics."——The St. Louis County Medical Society was addressed September 28 by Dr. John D. Hayward on "Presacral Sympathectomy for Dysmenorrhea."

NEW JERSEY

Personal.—Dr. Harry B. van Dyke, head of the division of pharmacology at the Squibb Institute for Medical Research, New Brunswick, has been appointed honorary professor of physiology at Rutgers University. He will also serve as research consultant in the bureau of biological research and will be a member of the graduate faculty.——Dr. Hyman I. Goldstein, Camden, has been elected a corresponding member of the Royal Italian Society of Gastro-Enterology of Rome.

District Meeting in Bridgeton.—The Fifth Councilor District of the Medical Society of New Jersey will hold a meeting in Bridgeton November 15 with the following speakers: Dr. Hilton S. Read, Atlantic City, "Evolution, Not Revolution, in Organized Medicine"; Dr. William J. Carrington, Atlantic City, "What Changes Will There Be in the Practice of Medicine in 1939?" and Allen A. Stockdale, D.D., New York, "Foundations of American Life." Legislators of the five counties in the district have been invited as guests.

Prosecutions by State Board.—The New Jersey board of medical examiners recently reported the following prosecutions during the past few months:

Harry A. Kaplan, Camden, naturopath, paid the penalty for practicing without a license.

Joseph West, Camden, who called himself a "doctor of spinal therapeutics," paid the penalty for a second violation of the medical practice act.

George Lezenby Sr., Camden, an "electrotherapist," paid the penalty for a third violation of the medical practice act.

T. Roberts Hill, Camden, who held himself out as a "foot correctionist," Morris Krichman, a pharmacist of Maple Shade, and Philip Mitter, Newark, a naturopath, were found guilty of practicing medicine without a license.

Samuel Talpins, David Samuels and Jacob J. Kohn, Newark pharmacists, George Maza, Newark chiropractor, Abraham Shavelson, East Orange pharmacist, Mary Bennett, Newark, who was prescribing "Liquid Life," and Joseph R. Messina, Newark, who held himself out as a scalp specialist, paid penalties for practicing medicine without licenses.

John Grassi, West New York pharmacist, was found guilty of practicing medicine without a license.

Alfred W. Reid, Collingswood, unlicensed chiropractor, found guilty of a second violation of the medical practice act.

NEW YORK

Society News.—At the annual meeting and dinner of the Madison County Medical Society, Oneida, October 13, the speakers were the following Syracuse physicians: Drs. Carlton C. Curtiss, "The Practitioner Looks at State Medicine"; Earle E. J. Mack, "Acute Infectious Mononucleosis"; Gordon D. Hoople, "Diagnostic Use of the Bronchoscope and Esophagoscope," and Tracy L. Bryant, "Gas Bacillus Infection."—— Dr. Frank H. Lahey, Boston, addressed the Medical Society of Westchester County, October 18, on "The Newer Developments in Thyroid States."——Dr. Francis M. Rackemann, Boston, addressed the Medical Society of the County of Nassau, Mineola, October 25, on "Allergy in General Practice."—— Dr. Irving J. Walker, Boston, addressed the Warren County Medical Society, Glens Falls, October 12, on appendicitis.—— Dr. Leon Unger, Chicago, addressed the Medical Society of Jamestown October 27 on "Allergy in General Practice."

Court Forbids State Board to Examine Foreign Physicians.—The State Board of Regents has been ordered to endorse the licenses of foreign physicians wishing to practice in New York if the physicians submit satisfactory proof of their qualifications. The order was contained in a decision by Supreme Court Justice Sydney Foster in a test case involving Drs. Julius Levi, Paul Erlanger and Maximilian Lewitter, brought by Irving Mariasch of the American Citizenship Committee of the New York County Lawyers Association after the board had refused to endorse the licenses of these physicians. About 100 physicians are affected by the order. In his decision Justice Foster said: "The statute does not require any examination. The regents' rule contravenes the statute and fixes a standard beyond that contemplated by the legislature. Under this principle it became the duty of the board to endorse petitioner's license if he submitted satisfactory proof that the same was issued on requirements substantially equivalent to those in force in this state at the time and also that he had practiced lawfully and reputably for the prescribed period."

New York City

Second Harvey Lecture.—Dr. Alexander Ashley Weech, associate professor of diseases of children, Columbia University College of Physicians and Surgeons, will deliver the second Harvey Lecture of the current series at the New York Academy of Medicine November 17. His subject will be "Significance of the Albumin Fraction of Serum."

Symposium on Diseases of the Skin.—Lectures on diseases of the skin will be presented by the Medical Society of the County of Queens November 14-17 at the society's building. Lecturers in the symposium will be Drs. Ida J. Mintzer, "Common Skin Conditions"; Charles S. Miller, "New Growths of the Skin"; Joel Schweig, "Parasitic Diseases," and Rudolph Boenke, "Therapeusis of Common Skin Diseases."

Personal.—Dr. John H. R. Barry, for thirty years assistant sanitary superintendent for the borough of Queens, has retired from the city service, having reached the age limit.—— Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research received the honorary degree of doctor of science at the opening of the University of Michigan Medical School, Ann Arbor, October 1, when he delivered the convocation address.

Fraternity Sponsors Lectures.—The Tau (Cornell) chapter of the Nu Sigma Nu Medical Fraternity is inaugurating a series of annual lectures on subjects of general interest to

the medical profession. Dr. Louis V. Hamman, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore, delivered the first lecture of the series November 10 in the auditorium of the Cornell University Medical College, 1300 York Avenue, on "Spontaneous Interstitial Emphysema of the Lung."

Cornerstone Laid for Health Center.—Mayor La Guardia, Nicholas Murray Butler, Ph.D., president of Columbia University, Dr. John L. Rice, health commissioner, and Dean Sage, president of the board of managers of Presbyterian Hospital, were the speakers at a ceremony for laying the cornerstone of the Washington Heights Health and Teaching Center October 17. The new center is one of five to be affiliated with the city's five medical schools for teaching public health. It will be operated in conjunction with the College of Physicians and Surgeons of Columbia University.

Another Doctors' Orchestra Organized. — About fifty physicians and dentists under the chairmanship of Dr. Israel Leopold Glushak have organized the Doctors' Orchestral Society with Ignatz Waghalter, formerly music director of the Berlin Charlottenburg Opera House, as conductor. Rehearsals are under way. The Wurlitzer Music Company, 120 West Forty-Second Street, has extended to the society the privilege of using its auditorium for rehearsals once a week. Membership is still open for enrolment; physicians and dentists interested in joining the orchestra may communicate with Dr. Glushak, 1 West Eighty-Fifth Street, New York.

NORTH CAROLINA

District Meetings.—The Seventh District Medical Society held a meeting in Charlotte October 18 with Dr. Edgar G. Ballenger, Atlanta, as the guest speaker on "Resistant Urinary Infections." Other speakers were Drs. Jackson T. Ramsaur, Cherryville, on "Female Sex Hormone"; James Lee Robinson Jr., Gastonia, "Acute Mesenteric Lymphadenitis," and Lester A. Crowell Jr., Lincolnton, "Practical Handling of Adult Uncomplicated Diabetes Mellitus." Dr. James Buren Sidbury, Wilmington, president of the Medical Society of North Carolina, spoke on the work of the state society.——Dr. David T. Smith, Durham, was the guest speaker at a meeting of the Ninth District Medical Society in Thomasville, September 29, on "Treatment of Local and Generalized Staphylococcus Infections with Staphylococcus Toxoid and Staphylococcus Antitoxin." Others on the program included Drs. Edward D. Andrews and George F. Busby, Salisbury, on "Thrombocytopenia in Infancy"; Edwin J. Cathell, Lexington, "Review of Recent Literature on Sulfanilamide, with a Case Report on Its Use in Peritonitis," and Reno K. Farrington, Thomasville, "Chronic Fibrous Incapsulated Peritonitis (Agglutinative Peritonitis)." Dr. James Buren Sidbury, Wilmington, president of the state medical society, also addressed the meeting.

OHIO

Society News.—Dr. Elmer L. Sevringhaus, Madison, Wis., addressed the Academy of Medicine of Cincinnati October 18 on "Pituitary Therapy in General Practice." Dr. Roy Glenwood Spurling, Louisville, Ky., addressed the academy October 4 on "Low Intraspinal Lesions as a Cause of Low Back and Sciatic Pain."——Dr. Rosco G. Leland, director, Bureau of Medical Economics, American Medical Association, Chicago, addressed the Summit County Medical Society, Akron, October 4, on "The Trend Toward the Socialization of Professions."——Dr. John A. Toomey, Cleveland, addressed the Stark County Medical Society, Canton, November 10, on "Specific Prevention and Treatment of the Acute Exanthems."——A symposium on medical economics was presented before the Academy of Medicine of Toledo and Lucas County October 7 by Drs. Barney J. Hein, Frederick M. Douglass and William A. Neill.

PENNSYLVANIA

"Medicine Man" Convicted.—A concessionnaire at the Lehighton fair selling a "medicine" was arrested, tried and convicted within three days in a drive of state authorities against fraudulent medicines, the state board of pharmacy reports. The man is said to have claimed that the medicine was a cure for rheumatism, sciatica, stomach ailments, nervousness and other diseases. The sample was taken to the laboratory of the state board of pharmacy at Harrisburg and found to be psyllium. Sentence was suspended on payment of the costs, about $19, and the concessionnaire was warned to stop selling fake medicines in Pennsylvania.

Philadelphia

First de Schweinitz Lecture. — Dr. Edward Jackson, Denver, will deliver the first de Schweinitz lecture of the section on ophthalmology of the College of Physicians of Philadelphia November 17 on "The Development of Ophthalmology in One Lifetime." The lecture was established in honor of Dr. George E. de Schweinitz, who died August 22.

Emergencies and the Profession.—The meeting of the Philadelphia County Medical Society November 9 was devoted to discussion of "National and Local Emergencies and the Medical Profession." The speakers were Col. Charles P. Stahr, Lancaster, Pennsylvania National Guard, on "The Medical Profession and the National Guard"; Brig. Gen. Wallace DeWitt, commandant, Army Medical Center, Washington, D. C., "The Doctor and the Army"; Comdr. William J. C. Agnew, San Diego, Officer in Charge of Reserve Affairs, Bureau of Medicine and Surgery, U. S. Navy, Washington, "The Doctor and the Navy," and Dr. Hubley R. Owen, chief surgeon, Philadelphia bureau of fire and police, "The Doctor and Local Catastrophic Emergencies."

Pittsburgh

Lectures on Diabetes.—Two lectures a year on diabetes are to be given in Pittsburgh under the terms of a gift by Miss Emilie Renziehausen in memory of her brothers. In 1937 Miss Renziehausen gave a fund of a million dollars to the Children's Hospital for research on diabetes. Dr. Charles H. Best, professor of physiology at the University of Toronto, will deliver the first lecture December 5 at the Mellon Institute on "Historical and Recent Development of the Insulin Situation."

SOUTH CAROLINA

Founder's Day at South Carolina.—The Medical College of the State of South Carolina, Charleston, observed Founder's Day, November 3. The speakers were:

Dr. Hugh P. Smith, Greenville, Sprue.
Dr. Daniel L. Smith, Spartanburg, Allergy in Children.
Dr. Douglas Jennings, Bennettsville, Extra-Uterine Pregnancy.
Dr. James J. Ravenel, Charleston, Renal Calculi.
Dr. Olin B. Chamberlain, Charleston, subject not announced.

Dr. Frederic M. Hanes, professor of medicine, Duke University School of Medicine, Durham, N. C., delivered the Founder's Day address at an evening banquet on "The Position of the Medical School in the Newer Concepts of Medical Practice."

District Meetings. — The annual meeting of the Seventh District Medical Association was held at Manning September 15 with the following speakers, among others: Drs. William H. Kelley, Charleston, "Nicotinic Acid in Treatment of Pellagra"; Virgil P. W. Sydenstricker, Augusta, Ga., "Pellagra," and James Heyward Gibbes, Columbia, "The Menace of Tick-Borne Diseases in South Carolina."—— The Fifth District Medical Society met in Winnsboro October 26 with the following speakers, among others: Drs. George H. Bunch, Columbia, on "Acute Appendicitis"; Lucius Emmett Madden, Columbia, "Coronary Thrombosis," and James C. McLeod, Florence, "Head Injuries." Dr. James R. DesPortes, Fort Mill, president of the South Carolina Medical Association, also made an address.

TEXAS

Changes in Health Officers.—Dr. Durwood L. Dodd has been appointed health officer of Austin, succeeding Dr. Francis Banner Gregg.——Dr. Lyman T. Cox, El Paso, has been appointed health officer of the city and county of El Paso, succeeding Dr. John W. Tappan, it is reported.——Dr. Arthur Gleckler, Sherman, recently succeeded Dr. Buford A. Russell as health officer of Grayson County.

Society News.—Drs. Maurice P. S. Spearman and Willis W. Waite, El Paso, addressed the El Paso County Medical Society September 12 on "Bronchoscopy as an Aid in General Diagnosis" and "Syphilitic Endocarditis of the Mitral Valve" respectively.——At a meeting of the Dallas County Medical Society October 27 the speakers were Drs. Casey E. Patterson, on "Treatment of Asthma"; Thomas E. Smith, "Hypertrophic Anal Papillae," and James T. Mills, "Surgical Treatment of X-Ray Burns and Nevi."

VIRGINIA

Society News. — Dr. Samuel A. Cosgrove, Jersey City, N. J., addressed the Virginia Peninsula Academy of Medicine, Newport News, September 19, on "Toxemias of Late Pregnancy." Dr. Louis H. Douglass, Baltimore, was the guest speaker at the annual meeting of the Virginia Obstetrical and Gynecological Society October 5 in conjunction with the annual

meeting of the Medical Society of Virginia in Danville, on "The Problem of the Posterior Occiput."——The Rockbridge County Medical Society was reorganized September 13 with Drs. Francis L. Thurman, Buena Vista, as president; Jesse Hugh Bailey, Brownsburg, vice president, and Edmund P. Tompkins, Lexington, secretary.

WASHINGTON

Personal.—Dr. Harmon T. Rhoads Sr., Everett, has been appointed surgeon to the Wilkins-Lincoln Ellsworth expedition to the South Pole.——Dr. Ralph Gregg of the U. S. Public Health Service, recently stationed in Tacoma, has been assigned to be health officer of Tacoma, succeeding the late Dr. Samuel M. Creswell.

Hospital News.—Dr. Simeon T. Cantril, Chicago, has been appointed to direct the cancer institute of Swedish Hospital, Seattle, with Mr. Herbert N. Parker, formerly of Manchester, England, as physicist. Dr. Cantril succeeds Dr. John E. Wirth, who will join the staff of the U. S. Public Health Service to conduct research under the cancer program authorized by the National Cancer Institute Act of 1937. John E. Rose, physicist since 1934, will also go to the public health service.

Society News.—Dr. Robert L. King, Seattle, addressed the Pierce County Medical Society, Tacoma, September 13, on "Symptoms and Signs of Rheumatic Fever."——Dr. Robert W. Langley, Los Angeles, showed a color film entitled "Heart Sounds, a Clinical Experiment in Sound Photography" at a meeting of the King County Medical Society, Seattle, October 3. Drs. Darrell G. Leavitt and Nathan K. Rickles addressed the society October 17 on "Surgical Treatment of Tuberculous Joint" and "Metrazol Therapy" respectively.——Drs. George H. Anderson, Spokane, and Edgar Murray Burns, Portland, addressed the first fall meeting of the Walla Walla Valley Medical Society, Walla Walla, October 13, on "Osteo-Arthritis of the Spine Causing Symptoms of Visceral Disease" and "Psychotherapeutic Ideas Applicable to General Medicine" respectively. Drs. Herbert F. Traut, New York, and George W. Pierce, San Francisco, will address the society November 14 on "Recent Advancements of Endocrinology" and "Repair of Nerves and Tendons from Traumatic Injuries" respectively.——Dr. Wallace E. Herrell, Rochester, Minn., addressed the Spokane County Medical Society, Spokane, October 13, on "Management of Ovarian Dysfunction with Reference to Diagnostic Aids."

WISCONSIN

Marquette Requires County Society Membership.—Members of the faculty of Marquette University School of Medicine, Milwaukee, will henceforth be required to hold membership in the Medical Society of Milwaukee County and the State Medical Society of Wisconsin. A motion to this effect was adopted by the executive faculty October 12 and approved by the president of the university. Every member of the faculty who is qualified to join the medical society must do so to retain his position. In addition, every person proposed for appointment who is qualified to belong to the society must present evidence of membership as a qualification for appointment to the medical school.

Society News.—Dr. M. Herbert Barker, Chicago, addressed the Rock County Medical Society, Janesville, September 27, on "Types of Hypertension and Their Treatment."——Drs. Wallace H. Steffensen, Grand Rapids, Mich., and Joseph L. Ransohoff, Cincinnati, addressed the Milwaukee Society of Clinical Surgery October 25 on "Management of Free Skin Grafts" and "Surgical Relief of Pain in Angina Pectoris" respectively.——Dr. William A. O'Brien, Minneapolis, and Mr. James H. Baker, executive secretary of the Hennepin County Medical Society, Minneapolis, addressed the Polk County Medical Society September 22 on "Medical News from the Standpoint of Physicians and Newspapermen."

HAWAII

Society News.—Dr. Walter C. Alvarez, Rochester, Minn., presented a series of lectures on gastro-enterology before the Honolulu County Medical Society recently.

New Mental Clinic.—A clinic for mental hygiene was recently established in Honolulu to serve the territory of Hawaii. Dr. Franklin G. Ebaugh, Denver, supervised the organization. A unit at Queen's Hospital has been given over to the clinic to provide hospitalization and treatment facilities. Dr. Edwin E. McNiel, New York, was to take charge of the clinic October 18. Steps were recently taken to initiate mobile mental health clinics to serve these islands.

GENERAL

Child Study Association Fifty Years Old.—The Child Study Association of America will observe its fiftieth anniversary November 14-15 with a conference at the Hotel Roosevelt, New York, followed by a three day institute. The conference theme will be "What do we know today about better methods of rearing children and developing better family life that we did not know a half century ago?" Headquarters of the association are at 221 West Fifty-Seventh Street, New York.

Examinations in Obstetrics and Gynecology.—The next written examination and review of case histories for group B candidates will be held in various cities of the United States and Canada February 4. Applications for this examination of the American Board of Obstetrics and Gynecology must be filed on an official application form in the office of the secretary at least sixty days prior to this date (or before December 4). The general oral, clinical and pathologic examinations for all candidates (groups A and B) will be conducted by the entire board, meeting in St. Louis May 15-16, 1939, immediately prior to the annual session of the American Medical Association. Applications for admission to group A examinations must be on file in the secretary's office by March 15, 1939. For further information address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh.

Meeting on Obstetrics and Gynecology.—The seventh annual meeting of the Pacific Coast Society of Obstetrics and Gynecology will be held at the Ambassador Hotel November 30-December 3 under the presidency of Dr. Raymond E. Watkins, Portland, Ore. The speakers will include:

Dr. Virgil E. Dudman, Portland, Arrhenoblastoma and Digerminoma.
Dr. Margaret Schulze, San Francisco, Granulosa Cell Tumors and Brenner Tumors.
Drs. Albert Mathieu and Albert W. Holman, Portland, Induction of Labor in Toxemia of Pregnancy.
Dr. Bernard J. Hanley, Los Angeles, Sulfanilamide in Obstetric Infections.
Dr. Ludwig A. Emge, San Francisco, Relation of Hormones to Carcinogenesis.

The program will also include a symposium on hemorrhage in pregnancy.

American Society of Tropical Medicine.—The thirty-fourth annual meeting of the American Society of Tropical Medicine will be held November 15-18 in Oklahoma City in conjunction with the meeting of the Southern Medical Association. Dr. Richard P. Strong, Boston, will deliver the third Charles Franklin Craig Lecture Tuesday afternoon, November 15, on "Progress in the Study of Infections Due to Bartonella and Rickettsia." Dr. Mark F. Boyd, Tallahassee, Fla., will deliver his presidential address at a luncheon Thursday November 17, on "A Résumé of Studies on the Relation of the Malaria Parasites to Their Hosts." Another feature will be a symposium on "Newer Clinical Aspects of Deficiency Diseases," presented by Drs. John B. Youmans, Nashville, Tenn.; George C. Shattuck, Boston; Tom D. Spies and William B. Bean, Cincinnati, and Alfred C. Reed, Leonid S. Cherney, Charles M. Wheeler, Ph.D., San Francisco, and William J. Dann, Ph.D., Durham, N. C.

Society News.—Dr. Edward L. Jenkinson, Chicago, was chosen president-elect of the American Roentgen Ray Society at its recent annual meeting in Atlantic City, N. J., and Dr. John W. Pierson, Baltimore, was inducted into the presidency. Other officers include Drs. Cornelius G. Dyke, New York, vice president; James B. Edwards, Leonia, N. J., treasurer, and Carleton B. Peirce, Montreal, secretary. The next meeting of the society will be in Chicago September 19-22.——Dr. John C. Dessloch, Rochester, N. Y., was chosen president-elect of the Associated Anesthetists of the United States and Canada at the annual meeting in New York in October. Dr. F. Hoeffer McMechan, Rocky River, Ohio, was reelected secretary. The next meeting will be held in St. Louis, May 15-21, 1939.——Dr. Henry W. Cook, Minneapolis, medical director of the Northwestern National Life Insurance Company, was elected president of the Association of Life Insurance Medical Directors at the annual meeting in New York October 20. Drs. Harold M. Frost, Boston, and Donald B. Cragin, Hartford, Conn., were elected vice presidents, and Dr. Edwin G. Dewis, Interlaken, N. J., secretary.——Dr. Charles D. Mitchell, Whitfield, Miss., was named president-elect of the Southern Psychiatric Association at its annual meeting in Atlanta October 11. Dr. Charles S. Holbrook, New Orleans, was installed as president, Dr. Whitman C. McConnell, St. Petersburg, Fla., was elected vice president and Dr. Newdigate M. Owensby, Atlanta, reelected secretary.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 22, 1938.

The State and Medical Research

Sir Edward Mellanby, secretary of the Medical Research Council, delivered the Harveian oration at the Royal College of Physicians on "The State and Medical Research." He said that private endowment of research had no proud history in this country, although there had been fine exceptions in the case of medicine. As to government support, it took a great war to make the government set up the Department of Scientific and Industrial Research in 1915. The Medical Research Committee was originated in 1913 in connection with the national health insurance act. This arrangement was terminated in 1919, and the Medical Research Council received its present title and constitution in 1920. It is financed with money provided by the government. During the present century there have been two rapid increases in medical research activity, running side by side: the one in this country, organized and to a large extent financed by the state, the other in the United States, richly endowed and controlled by private interests. Each had already produced a good harvest. The recent Nuffield scheme, started at Oxford, was possibly an indication that private persons would in the future regard the endowment of research here as more worthy of their support. The most limiting factor in all research activity, but especially in medical research, was personnel. The number of people who were trained for and capable of doing work of this type was not large. By various means the council was trying to increase their number.

Speaking of the work of the National Institute for Medical Research, Mellanby said that it had always reached the highest standard. One aspect of it of particular interest to the physician was the biologic standardization of drugs. In this the institute led the world and had rendered a great service to mankind. Another line of policy was the placing of units of research in different institutions, and this had shown great developments in recent years. Short of a catastrophic change, which might upset or even destroy national life, the future was bright. There was no doubt that more and more knowledge, giving control, both preventive and curative, of disease would be obtained. The difficulty he foresaw was not that of obtaining knowledge but of its application to human needs. This would depend on the education and wisdom of individuals. Without an enlightened public opinion the average person would do nothing to save himself, and the state would do less. There was a shocking neglect in this country of using the available knowledge for the prevention of diphtheria.

The Importance of Bacteremia

In an address to the Nottingham Medico-Chirurgical Society, Prof. J. A. Ryle pointed out that bacteria enter the circulation more readily and more often than is supposed and that this fact is important in recognizing and understanding many diseases. Blood infection may be innocent or may be serious. Ryle distinguishes bacteremia from septicemia. Bacteremia implies nothing more than the presence of organisms in the blood and is a pathologic observation rather than a clinical state. But septicemia is characterized by fever, rigors and a tendency to metastatic lesions and it carries a grave prognosis. It is due to, but is not synonymous with, bacteremia, which can occur in the absence of septicemic symptoms. Although meningococcic and pneumococcic bacteremia may be complicated by rigors and metastatic infection, the term septicemia should be reserved for streptococcic and staphylococcic infections.

Osteomyelitis, perinephric abscess and some other staphylococcic lesions were long considered local diseases, with no reference to the primary focus or the pathways of infection or the possibility of other foci. But in fatal staphylococcic septicemia the necropsies showed that the bones, the kidney, the lungs and the heart were among the selected sites for metastatic infection. Clinical study reveals a primary focus in the shape of a boil, carbuncle or infected abrasion in more than three fourths of cases of remote and deeply seated staphylococcic infections. Perinephritis has been shown to represent a spread of infection from a metastatic cortical abscess which has perforated the renal capsule. Osteomyelitis and renal and prostatic abscesses may develop without any intervening septicemic illness. As these tissues can be reached only through the blood stream, a relatively benign bacteremia must have occurred, although it is usually too late to obtain a blood culture. Staphylococcic bacteremia is more common than is supposed. Many patients with recurring furunculosis must pass through unrecognized phases of transient hemic infection, and obscure fevers can sometimes be shown to be due to this cause.

In a considerable proportion of cases of pneumonia, pneumococci may be grown from the blood during the early stages and in a smaller proportion throughout, without carrying a bad prognosis. A hemic infection can be inferred in the cases complicated by meningitis, peritonitis or arthritis. In meningitis the meningococcus has been grown from the blood. The suddenness of the disease in many cases, the petechial rash and the occasional arthritis and pericarditis all indicate blood infection. Streptococcus viridans has its abode in the mouth and particularly in tooth sockets. It is the commonest organism found in the blood in subacute endocarditis. The accident of a bacteremia in a subject with damaged or anatomically abnormal valves determines the disease. Okell and Elliott have shown how slight trauma may drive organisms from the dental sockets into the blood stream. Within a few minutes after the extraction of teeth from a septic mouth a transient streptococcic bacteremia was found in 75 per cent of the cases. Even with no obvious disease of the gums, a transient bacteremia followed in 34 per cent. Of 110 patients with septic mouths 10.9 per cent were found to have a streptococcic bacteremia irrespective of operative intervention.

Thus a bacteremia from trivial causes or accompanying a serious local infection is more common than is generally supposed. Ryle recommends that a blood culture should be performed in every case of typhoid or of streptococcic or staphylococcic septicemia, whenever bacterial endocarditis is possible, in any case presenting rigors, and in any sustained or intermittent fever for which no adequate local or nonbacterial cause can be discovered. Its repetition with colony counts may give useful information with regard to the progress of the disease and assist in the study of the effects of chemotherapeutic agents.

Polycyclic Hydrocarbons Which Produce Cancer

At the recent meeting of the British Association, Prof. J. W. Cook, F.R.S., pointed out that a considerable group of polycyclic hydrocarbons were known to be carcinogenic. They differed widely in the rapidity with which they produced tumors. In animals cancer of the skin, liver, uterus, prostate, stomach and brain could be so produced. The manner in which these carcinogenic agents transformed normal into malignant cells was unknown, but some of the factors of molecular structure that were associated with carcinogenic activity could be stated. Thus the meso positions (9 and 10) of the benzanthracene molecule were favorable for carcinogenic activity, and the 9:10-dimethyl compound with a methyl group in each of these meso positions, recently synthesized by Bachmann at the University of Michigan and tested at the Royal Cancer Hospital, had proved to be the most potent cancer-producing compound yet produced. In mice it gave rise to cancers of the skin, which first appeared as multiple warts within thirty-five days. Excepting the compound 5:9:10-trimethyl-1:2-benzanthracene, no other sub-

stance produced cancer in less than double this time. The compounds coming next in carcinogenic power were methylchloranthrene and benzpyrene, for which the latent periods were seventy-five and 100 days respectively. Methylchloranthrene could be prepared in the laboratory by comparatively simple reactions from cholesterol and bile acids. It was conceivable that similar transformations could occur in the body, but evidence of this was lacking.

PARIS

(From Our Regular Correspondent)

Oct. 15, 1938.

Surgical Treatment of Tumors of the Lung

The subject of the third symposium at the recent meeting of the International Surgical Society was the surgical treatment of pulmonary cysts and tumors. The first paper was by Dr. Costantini of Algiers, who said that the two great dangers in pulmonary surgery were pneumothorax and collapse of the lung. The latter, as the result of vagosympathetic reflexes, may be followed by fatal disturbance of the cardiac innervation. Of less importance but not to be overlooked are two other factors, elasticity of the lungs and the condition of the mediastinum, i. e. whether it is mobile or rigid. As a rule, a pneumothorax is well tolerated by younger persons, complications being most often observed after the age of 50, also in patients who present the cardiac effects of a chronic infection or of a cancerous cachexia. Chilling of the lung also plays an important part in the production of shock and should be guarded against by giving large quantities of dextrose solutions at 40 C. (104 F.) by the drop method before operation and the use, during the operation, of large, hot gauze packs and sponges. The combined use of the intratracheal method of anesthesia and of nitrous oxide is the best way to prevent pulmonary collapse. These should be supplemented by giving both atropine and ephedrine. Costantini believed that excessive bronchial secretion during the operation could be best combated by placing the patient in a moderate Trendelenburg position. Ligation of the large bronchi and of the pulmonary artery is generally well tolerated but reflex cessation of cardiac action may occur during ligation of the artery. Bronchial fistulas usually heal spontaneously. A preoperative pneumothorax is an efficacious method to prevent a pulmonary collapse. After a few months the opposite lung will completely compensate the effects of a pneumectomy. He warmly recommended exploratory thoracotomy for diagnostic purposes.

The second paper on cysts and tumors of the lung was read by Dr. José Arce of Buenos Aires. With the exception of cases of echinococcic cysts of the lung, which should be operated on in one stage, it is preferable to establish pleuropulmonary adhesions before operating on patients with pulmonary suppuration. After three ribs have been resected, a gauze pack is firmly inserted in such cases as a preliminary step. The speaker warmly endorsed the recommendation of Dr. Costantini as to the value of preoperative pneumothorax in the prevention of pulmonary collapse. Preference was given to local, regional or spinal anesthesia but it is impossible to avoid the use of general anesthesia in very difficult cases and also when positive pressure was used. Malignant tumors of the lung are more frequently encountered than those of the benign type. Dr. Arce prefers a three step operation and, during the final stage, complete removal of the lung. Of twenty-seven cases of cancer only twelve were considered to justify a radical procedure. Three lobectomies and nine pneumectomies were done, with eleven deaths.

The third paper was by Dr. Forni of Venice, who stated that an operative indication existed in only about 10 per cent of the cases of cancer of the lung. After a critical analysis of all reported cases, his conclusions were that a complete one step pneumectomy through an anterior incision is the operation of choice in tumors of the larger bronchi and that a lobectomy preceded by pneumothorax and phrenicectomy should be done for circumscribed tumors in the smaller bronchi. Of thirty-three pneumectomies (thirty in one step and three in two steps) ten are cured. In only three of these ten cases has a year elapsed since the operation. Three patients show signs of recurrence and twenty died following the operation. Of sixty-two lobectomies, thirty-eight of which were one step operations, there are sixteen cures, thirteen operative deaths and eleven fatal recurrences. In the other twenty-four lobectomies, in which a two or three step procedure was employed, there were nine cures, ten operative deaths and five recurrences.

Dr. Baggio of Pisa, in the fourth paper, stated that he preferred a two step operation in echinococcic cysts of the lung and the use of a short drainage tube for a very short time after operation in order to avoid cutaneous fistulas of long duration.

The discussion on the present status of pulmonary surgery was opened by Mr. Tudor Edwards of London, who limited operative intervention to cancer of the bronchi. In 60 per cent of his cases the search for cancer cells, according to the Dudgem technic, had been positive. He warmly recommended the use of preoperative pneumothorax, because a large exposure is needed in order to establish pleural adhesions and carry out an extensive pneumectomy as close as possible to the bifurcation of the trachea with separate ligation of the bronchial vessels. The percentage of cures is still very small. Of 172 persons with cancer of the bronchi seen over a period of thirty months, twenty-eight were subjected to an exploratory operation; only thirteen have survived a pneumectomy but six have lived more than six months.

Dr. Stuart W. Harrington reported the results of 121 operations for intrathoracic tumors at the Mayo Clinic. There were nineteen cysts of the lung or anterior mediastinum, of which thirteen were of the teratoid type. It was possible to remove the cyst completely in sixteen cases and to do a pneumectomy in two cases. In one, a malignant condition, the entire tumor could not be removed. In seventeen of the eighteen cases in which complete removal was possible cure apparently resulted, the interval since the operation not being stated. The remaining patient showed signs of recurrence six months after operation.

Dr. James M. Mason of Birmingham, Ala., reported a case of bronchiogenic cancer of the lower lobe of the right lung in which lobectomy had been done with apparent cure in spite of a postoperative pyopneumothorax.

Drs. Dargent and Bérard of Lyons called attention to the difficulties encountered in the early diagnosis of a primary cancer of the lung. An anteroposterior and a lateral bronchogram, as well as the more recent roentgenographic method of diagnosis in sections or tomography have been of great aid. An exploratory operation should not be postponed until pleural adhesions, which are usually of malignant character, have formed. Irradiation with radium is preferable to an incomplete operation, when pleural adhesions exist. Some types of tumors of the lung are very radiosensitive and even in the radioresistant forms irradiation relieves both the pain and the dyspnea.

Dr. Chiarolanza of Naples stated that the mortality following operations for tumors of the lung is still very high. Twenty fatalities occurred in thirty-three pneumectomies, twenty-three fatalities in sixty-three complete lobectomies and twenty-four fatalities in seventy-three atypical operations. The recurrence statistics are equally unfavorable.

THE NEXT INTERNATIONAL SURGICAL CONGRESS

The next meeting of the International Surgical Society will take place at Stockholm during the summer of 1941. At the recent meeting in Brussels Leopold Mayer of Belgium was elected president, and Alessandri of Italy, Arce of Argentina,

Lenormand of France and G. Grey-Turner of England vice presidents. Sir John d'Arcy Power of London was elected honorary president and Prof. Verhoogen of Brussels chairman of the permanent committee. The subjects to be discussed at the 1941 congress include (1) postoperative complications, (2) surgical treatment of pulmonary tuberculosis and (3) sequelae and complications of operations on the biliary tract.

Physical Examination of First Year Students

The dean of the Faculté de médecine, Professor Tiffenau, has just sent a notice to every student who has been matriculated for the present school year to go to the Léon Bourgeois dispensary for a complete examination. Although the latter is not obligatory, every student is urged to have at least a radioscopic examination of the chest and tuberculin tests made, because it has been found that a number of students and pupil nurses show evidences of incipient tuberculosis soon after being exposed to infection while working in wards to which patients with some form of the disease are admitted.

International Union Against Cancer

The International Union Against Cancer, which aims to coordinate the work of all organizations engaged in the study of cancer and the means to combat it, has arranged an international cancer week from the 23d to the 30th of November in fifty countries. During this cancer week the first meeting in Paris will be held at the Sorbonne, November 23. At the international cancer reunions in Paris a number of papers will be read to commemorate the discovery of radium, electrons, x-rays and hertzian waves.

BERLIN

(From Our Regular Correspondent)

Oct. 3, 1938.

Malignant Anemia

Sternal puncture has proved its worth as an important method of examination in the differential diagnosis of diseases of the blood. The procedure is valuable for determination of granulocytopenia, purpura haemorrhagica and similar pathologic conditions in which the formation of a particular type of bone marrow cells is disturbed. It is equally valuable in various forms of anemia characterized by damage to granulocytes and megakaryocytes. In a condition observed of late with relative frequency, panmyelophthisis, all three types of marrow cells are involved. Another distinct entity observed more frequently in recent years than before is characterized by hyperchromic anemia and thrombopenia and by proliferation of the myeloblasts of the bone marrow. Analogous results in the sternal puncture (material isolated nucleated erythrocytes, absence of megakaryocytes, abundance of myeloblasts, isolated myelocytes and extremely few neutrophils) may be observed in no other condition excepting acute myeloblastic leukemia, in contrast to which, however, the newly described condition runs a chronic course lasting from three to nine months. Professor Seyderhelm of Frankfort on the Main, who has provided a full description of the entity, calls it "malignant anemia."

In the foreground of the clinical picture is the severe anemia, which cannot be ameliorated by any hematopoietic agent or by administration of liver. Only by blood transfusions can life be prolonged and then for but a brief while; no remissions in the blood picture are effected thereby, however. The color of the patient is usually straw yellow and reminiscent of the pernicious anemia patient; yet there is no increased destruction of blood cells, no glandular swelling and no enlargement of the spleen. An achylia gastrica is nearly always present. Hemorrhage from the alveolar and nasal mucosa is a common symptom and cutaneous hemorrhage occurs toward the end. There is recurring fever. The course is always fatal. In the leukocyte count there is a predominance of from 70 to 90 per cent of nongranular, ostensibly lymphoid, cells which are identifiable as myeloblasts by the positive oxydase reaction. The leukocyte count amounts initially to from 3,000 to 5,000; later it is wont to increase to from 10,000 to 15,000 or more (pseudoleukemic myeloblast picture). Microscopic studies disclose a large number of myeloblasts in the marrow, and foci of myeloblasts in the liver and spleen. The splenic pulp is filled with myeloblasts. Periportal and intercapillary foci are present in the liver. The absolute shortage of neutrophils, the absence of thrombocytes in the blood and the high grade anemia suggest a kinship with agranulocytosis and panmyelophthisis. However, there is no question of a proliferation of cells but rather of a disturbed development of the myeloblasts accompanied by secondary decomposition and metaplasia. This was proved by studies made by Seyderhelm and Vollmar, and through tissue cultures of leukocytes obtained from normal blood and blood of myeloid leukemia and "malignant leukemia" patients. Whereas the leukocytes of myeloid leukemia are round cells with abundant protoplasmic flow and exhibit almost no motility, the leukocytes in "malignant anemia" form numerous ameboid processes and show rapid movement, characteristics not to be observed elsewhere except in tissue cultures of sarcoma and carcinoma cells. Microscopic study of the leukocytes discloses the principal difference in the functional condition of particular types of leukocytes; such determinations are impossible by means of a purely morphologic cell count. It has further been established that "malignant anemia" may be transmitted to chickens and rabbits but not to rats and guinea pigs. The affected animals develop a hyperchromic anemia from which they recover in time. In the blood and bone marrow of the more recently observed "malignant anemia" patients, other cellular formations were determined which, in their structure and specific stainability (victoria blue), resembled ultramicroscopic virus. Similar structures have also been found in some of the sick animals. The possibility that this observation is of etiologic significance must for the present be evaluated only most critically and cautiously.

Treatment of Carcinoma of the Cervix Uteri

The ordinarius in gynecology at Koenigsberg recently reported on the therapy of carcinoma of the cervix uteri, in use at the university's gynecologic clinic, which he directs. The statistics submitted cover twenty-seven years (1910-1927); they are of special interest because the well directed Koenigsberg clinic has at all times been particularly concerned with this problem. During the specified period 1,479 women were first treated for carcinoma of the cervix uteri at the clinic. During the directorship of Prof. Georg Winter (1910-1925) complete permanent remissions were obtained in 15 per cent of the cases (in the period from 1910 to 1913) and in 11.5 per cent (in the period 1919-1925). The number of patients who were lost track of by the clinic is, to be sure, around 12 per cent. Besides one should remember that during the mentioned periods radiotherapy, if utilized at all, was still only in its rudimentary stages as a technical procedure. Under Prof. Wilhelm Zangemeister, director from 1926 to 1932, the proportion of complete permanent remissions rose to 18 per cent; surgery had by that time been completely relegated to the background in favor of intensive irradiation. Since 1932, under the present director, "elective" therapy, in Stoekel's sense of the term, has been applied to cancer cases at Koenigsberg, as elsewhere; surgical interventions (radical vaginal operation) were performed on about 33 per cent of the patients. Among women who underwent operations in 1932 and for whom follow-up records of the five ensuing years are extant, the proportion of complete remissions was 30 per cent, the optimal corresponding incidence thus far obtained. In recent years (1932-1936) primary operative mortality amounted to 4.4, primary mortality of patients treated with radium to 3 per cent. Of patients who died within the last five years a larger proportion were kept free of recurrence and capable of activity for more or less substantial periods.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 27, 1938.

Hydatid Disease in New Zealand

The figure for hydatid admissions to public hospitals in New Zealand during 1937 is the second highest on record, 126 compared with a figure of 133 for 1936 (the record) in a population of 1½ million. A fair estimate places the number of fresh cases of infection at from 125 to 150 a year and there is evidence to show that, although in some districts (Otago for example) hydatid disease is less common than it used to be, in New Zealand as a whole the incidence of the disease is increasing rather than diminishing. Christchurch Metropolitan Hospital last year showed a proportion of one hydatid for every 216 patients, a rate heretofore unequaled in New Zealand or in Australia. Mortality figures have apparently decreased. In 1937 fourteen deaths were reported for the whole of the dominion, eight of which occurred in public hospitals.

Figures for the incidence of hydatids in sheep and cattle in New Zealand are high and show no sign of diminution. Stated generally, on an average about half of these farm animals, which are essential to the country's economic welfare, are found infected. In old sheep in some districts the incidence approaches 100 per cent.

The incidence of hydatid tapeworm in dogs is also high. From these figures it is easily seen that opportunities are abundant for dogs to become infected through feeding on raw livers or lungs of sheep containing hydatid cysts. It has been shown that only about one third of New Zealand dogs are susceptible to infection, but there are 150,000 dogs in a population of 1,500,000 human beings.

DEPARTMENT FOR HYDATID RESEARCH

For many years a small but active department at the medical school has been engaged in the work of hydatid disease research and has, among other things, organized and conducted a vigorous campaign of prevention. This year has seen the inauguration by the New Zealand government of a national council for medical research, whose main functions will be to foster the study of the prevention of such menaces to the public welfare as tuberculosis, cancer, goiter, hydatid disease and malnutrition and, when deemed necessary, to provide the funds required. The medical school department for hydatid research will henceforth continue its work as a unit in this organization.

Tables of human incidence compare unfavorably with those regarding prevalence in all other countries except Uruguay and Argentina, where hydatid disease continues to be regarded as a national malady. These two countries, particularly Uruguay, are now organizing an intensive campaign of hydatid prevention largely on the educative and legislative lines which have been adopted in New Zealand.

Ophthalmological Society of Australia

Interest attaches to the recently formed Ophthalmological Society of Australia, chiefly because of its constitutional relationship with the British Medical Association in Australia. In Great Britain and elsewhere it is customary for independent clinical societies to be formed or to exist outside the British Medical Association. Such a tradition bears inherent weaknesses, for such small independent societies can rarely unite for common action. In Australia the members of the British Medical Association have made a new departure. The ophthalmologists of the commonwealth felt that they needed a society in which those practicing this branch of medicine could unite for the advancement of their specialty by meetings, publications, libraries and museums, research work and the provision of prizes for research work, and by postgraduate lectures. Instead of starting an independent body they have formed such a society within the association—the Ophthalmological Society of Australia (British Medical Association). Those eligible for ordinary membership are all those members of the British Medical Association who specialize in ophthalmology and whose qualifications are approved by the council of the society. Its rules show that it is completely autonomous yet part of the association. It is hoped that the successful functioning of this society may induce some of the existing extramural bodies to become part and parcel of the British Medical Association and in so doing consolidate the unity of the profession, for unity among medical men was never so essential as now, when medicine is threatened with state control, which, unless much opposition is presented, is certain to develop along empirical rather than scientific lines.

Fatal Injections of Paraldehyde

There occurred in Sydney recently the death of two brothers, aged 15 and 13, following rectal injections of paraldehyde given them at a private hospital preparatory to an operation for the removal of tonsils. Postmortem examinations established the cause of death in each case as asphyxia with cardiac failure due to an overdose of the drug. It was disclosed at the inquest that the material for injection had been dispensed as ounces instead of drachms. Although every possible treatment was used in an endeavor to save the boys' lives after the discovery of the mistake, both died within twenty-four hours of the injection. The chemist responsible was committed for trial on a charge of manslaughter. Evidence was given for the defense that he possessed an excellent record as a chemist and that except for this fatal error he was a careful and efficient dispenser. He had, however, been through severe treatment for cancer of the throat, which apparently had now been cured. It was contended that in this condition of suffering even a skilled man might easily make a mistake. He was employed at a Friendly Society dispensary and dealt with between 800 and 1,000 prescriptions a month. At the time of the fatal mistake he was making them up at the rate of one every minute and a half. The jury returned a verdict of not guilty. It was pointed out, however, that negligence on the part of a dispenser is a very grave menace to the public and therefore is criminal negligence.

Marriages

THOMAS J. FLOYD JR., Jersey City, N. J., to Miss Juliette Jordan of Eufaula, Ala., in Columbus, Ga., in August.

RAYMOND STEADMAN, Kingsport, Tenn., to Miss Bonnie Day of Little Rock, Ark., at Franklin, Tenn., September 3.

WILLIAM STURGES PARKER, Merion Station, Pa., to Miss Anita Woodruff Jones of Philadelphia, September 10.

JOSEPH E. FUNK, Laurelton, N. Y., to Miss Margaret Christopher of Perth Amboy, N. J., August 20.

ROBERT GORDON CARNAHAN to Miss Sara Elisabeth Alexander, both of San Antonio, Texas, September 8.

CHARLES LEE BUXTON, New York, to Miss Helen Morgan Rotch of Middleboro, Mass., September 3.

MAURICE F. STOCK, Fresno, Calif., to Miss Angela Blanche Schlich of Okawville, Ill., September 22.

ALFRED M. PAISLEY, Jacksonville, Ill., to Miss Elizabeth Winger of Keokuk, Iowa, September 3.

ALBERT P. D'ERRICO, Dallas, Texas, to Miss Carol Whitney Van Etten of New York, October 18.

THOMAS HARROP MILLER to Miss Mary Katherine Flinterman, both of Detroit, September 10.

JOSIAH CHARLES TRENT, Okmulgee, Okla., to Miss Mary Duke Biddle of New York in June.

HERBERT F. LARAMORE, Livingston, Texas, to Miss Jean Howell of Atlanta, Ga., August 29.

JESSE JAMES PORTER, Norton, Va., to Miss Nell Campbell of Princeton, W. Va., September 10.

MAURICE ERVIN HODGDON to Miss Bettie Fullerton Marshall, both of Pittsburgh, July 20.

Deaths

Earl Baldwin McKinley ✠ dean and professor of bacteriology at the George Washington University School of Medicine, Washington, D. C., was on the *Hawaii Clipper* which was lost over the Pacific Ocean en route to Manila July 28. Dr. McKinley was born in Emporia, Kan., Sept. 28, 1894. He received a degree from the medical school of the University of Michigan, Ann Arbor, in 1922, where he was instructor of bacteriology and biochemistry during 1919 and 1922. During 1924 and 1925 he was a fellow of the National Research Council and studied at the Pasteur Institute of the University of Brussels. In 1922 he was appointed assistant professor of pathology and bacteriology at Baylor University College of Medicine, Dallas, Texas, and in 1923 was made professor of hygiene and bacteriology and chairman of the department. In 1925 and 1926 he was assistant professor of bacteriology at the Columbia University College of Physicians and Surgeons, New York, and in 1926 and 1927 was an associate professor. He was professor of bacteriology at the same school and director of the School of Tropical Medicine, University of Puerto Rico, from 1928 to 1931. During 1927-1928 he was field director of the International Health Board at Manila, P. I. He was an intelligence officer of the U. S. Army during the World War. Dr. McKinley was a fellow of the American College of Physicians and the Royal Society of Tropical Medicine and Hygiene (London); corresponding member of the Société belge de médecine tropicale (Brussels); in 1938 president and in 1936-1937 vice president, American Association of Pathologists and Bacteriologists; formerly secretary of the American Academy of Tropical Medicine; member of the executive committee, division of medical sciences of the National Research Council; member and on the editorial boards of the Society of American Bacteriologists and the American Association of Immunologists. He was secretary and member of the advisory board of the American Leprosy Foundation and executive secretary and director of the American Foundation for Tropical Medicine. Dr. McKinley was the author of "Filterable Virus Rickettsia Diseases," 1929, and "A Geography of Disease," 1935.

Archie Burt Chappell ✠ Middletown, N. Y.; Albany (N. Y.) Medical College, 1905; member of the American Academy of Pediatrics; past president of the Orange County Medical Society; member of the board of health; on the staffs of the Horton Memorial Hospital, Middletown, Newton (N. J.) Memorial Hospital, Goshen (N. Y.) Hospital, Monticello (N. Y.) Hospital, Tuxedo Memorial Hospital, Tuxedo Park, Maimonides Hospital, Liberty, and the Municipal Sanatorium, Otisville; aged 55; died, August 28, of coronary occlusion.

Harold Merle Goodwin, Bangor, Maine; Harvard University Medical School, Boston, 1913; past president of the Penobscot County Medical Society; member of the Maine Medical Association; fellow of the American College of Surgeons; served during the World War; on the staff of the Eastern Maine General Hospital; aged 52; died, August 10, of adenocarcinoma of the cecum with secondary involvement of the liver.

Leo Howard Flynn, Eau Claire, Wis.; Northwestern University Medical School, Chicago, 1912; member of the State Medical Society of Wisconsin; past president and secretary of the Eau Claire County Medical Society; city physician, county physician and city health officer; served during the World War; on the staffs of the Sacred Heart and Lutheran hospitals; aged 54; died, August 19, of coronary occlusion.

Lowell Mason Gates, Scranton, Pa.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1878; member of the House of Delegates of the American Medical Association in 1913 and 1915; member and formerly vice president of the Medical Society of the State of Pennsylvania; past president of the Lackawanna County Medical Society; aged 86; died, August 14.

Anders G. Hovde ✠ Los Angeles; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Hollywood Hospital and the Queen of Angels Hospital; aged 62; died, August 14, of coronary thrombosis.

Adolphus George Wippern, Chicago; Missouri Medical College, St. Louis, 1890; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1892; member of the Illinois State Medical Society; formerly on the staff of St. Elizabeth's Hospital; aged 70; died, August 15, of arteriosclerosis, nephritis and diabetes mellitus.

Frank C. Richmond, Madison, Wis.; College of Physicians and Surgeons of Chicago, 1894; member of the American Orthopsychiatric Association; formerly director of the psychiatric field service of the Wisconsin State Board of Control; formerly a lawyer; aged 64; died, August 29, in St. Mary's Hospital, of coronary thrombosis.

Clarence A. Earle ✠ Des Plaines, Ill.; College of Physicians and Surgeons of Chicago, 1887; member of the American Academy of Pediatrics; for many years attending physician to St. Mary's Training School; on the staff of the Northwestern Hospital; aged 76; died, October 28, in St. Luke's Hospital, Chicago, of coronary thrombosis.

William Madison Higgins, New York; University of Vermont College of Medicine, Burlington, 1909; formerly instructor and lecturer in gynecology at the University and Bellevue Hospital Medical College; fellow of the American College of Surgeons; aged 57; on the staff of the Bellevue Hospital, where he died, August 20.

William Anderson ✠ Sharpsburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1900; served during the World War; on the staff of the Western Pennsylvania Hospital, Pittsburgh; aged 66; died, August 14, in the Woman's Christian Association Hospital, Jamestown, N. Y., of coronary thrombosis.

George Hall Beers, Auburn, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; on the staffs of the Auburn City and Mercy hospitals; past president and secretary of the Cayuga County Medical Society; aged 69; died, August 16, of coronary thrombosis.

Hiram Benjamin Martin, Huntington, W. Va.; Eclectic Medical Institute, Cincinnati, 1905; member of the West Virginia State Medical Association; served during the World War; aged 57; on the staff of St. Mary's Hospital, where he died, August 23, of uremia and cardiorenal vascular disease.

Charles Ralston Hughes ✠ Philadelphia; Medico-Chirurgical College of Philadelphia, 1911; served during the World War; on the staff of the Bryn Mawr (Pa.) Hospital; aged 51; died, August 10, of Streptococcus viridans septicemia with subacute bacterial endocarditis.

James Robert Nelson, Kingston, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1869; on the staff of the Kingston Hospital; aged 90; died, August 24, of cerebral hemorrhage and arteriosclerosis.

Albert Prentiss Alexander, Como, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; member of the Mississippi State Medical Association; county health officer; for many years president of the school board; aged 63; died, August 9.

Edward Alexander Wareham ✠ Hagerstown, Md.; University of Maryland School of Medicine, Baltimore, 1883; on the staff of the Washington County Hospital; aged 79; died, August 18, of carcinoma of the prostate with metastases to the bladder.

Horace Maurice Mayfield, Tyler, Texas; University of Texas School of Medicine, Galveston, 1932; on the staff of the Mother Francis Hospital; aged 31; died, August 25, of anaphylactic reaction due to the bite of an insect, presumably the red wasp.

Elias Wyman Davis, Seymour, Conn.; Yale University School of Medicine, New Haven, 1892; past president of the New Haven County Medical Society; aged 84; died, August 30, in Hartford of fracture of the neck of the femur and pneumonia.

Charles Dunaway Quinn, Utica, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1921; on the staff of St. Luke's Home and Hospital; aged 40; died, August 26, of acute appendicitis, tuberculosis and peritonitis.

Harrison Gray ✠ Norwich, Conn.; Jefferson Medical College of Philadelphia, 1919; health officer; served during the World War; on the staff of the William W. Backus Hospital; aged 61; died, August 26, of coronary thrombosis.

Edward Broquet, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1886; member of the Medical Society of the State of New York; aged 80; died, August 4.

Clarence Mangan Malone, Shamokin, Pa.; Medico-Chirurgical College of Philadelphia, 1898; served during the World War; aged 61; died, August 9, at the Shamokin State Hospital of cerebral hemorrhage.

William George Scott, Portland, Ore.; St. Louis University School of Medicine, 1911; served during the World War; aged 56; died, August 27, of coronary thrombosis, uremia and polycystic kidneys.

Arthur L. Seyse ⊕ Arcade, N. Y.; University of Buffalo School of Medicine, 1908; for many years health officer and formerly coroner; aged 55; died, August 29, of cerebral hemorrhage and heart disease.

Norbert Julius Lowry, Cresco, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 59; died, August 31, of coronary thrombosis.

Robert McGeehon Hope, Mercer, Pa.; Cincinnati College of Medicine and Surgery, 1874; member of the Medical Society of the State of Pennsylvania; aged 89; died, August 3, at New Wilmington.

Frank Harvey Grim, Revere, Pa.; Jefferson Medical College of Philadelphia, 1881; for many years director of the township schools and formerly secretary; aged 78; died, August 16.

John Henry Steidl, Trudeau, N. Y.; Harvard University Medical School, Boston, 1929; assistant superintendent of the Trudeau Sanatorium; aged 39; died, August 9, of uremia.

John R. Langford, Swansea, S. C.; College of Physicians and Surgeons, Baltimore, 1885; member of the South Carolina Medical Association; aged 82; died, August 21, at Pelion.

Albert George Mott, Bellerose, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York, 1912; aged 50; was killed August 6, in an automobile accident.

Robert Richard Wallace, Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1882; L.R.C.S., L.R.C.P., Edinburgh, Scotland, 1882; died, August 15.

William J. A. O'Hara ⊕ Bridgeport, Conn.; College of Physicians and Surgeons, Baltimore, 1893; aged 74; died, August 4, of hypertensive heart disease and hemiplegia.

Edwin Ewell Harris, Grinnell, Iowa; Howard University College of Medicine, Washington, D. C., 1895; member of the Iowa State Medical Society; aged 71; died, August 6.

Edward J. Douhet, Lakewood, Ohio; Western Reserve University Medical Department, Cleveland, 1885; aged 72; died, August 4, in the Fairview Park Hospital, Cleveland.

Jerome C. McKinley, York, Neb.; Louisville (Ky.) Medical College, 1891; aged 77; died, August 7, in a sanatorium at Lincoln of cerebral hemorrhage and arteriosclerosis.

Vasilios Konstantinos Papavasiliou, Boston; Tufts College Medical School, Boston, 1915; member of the Massachusetts Medical Society; aged 54; died, August 1.

Thomas Harrison Mitchell, Jamestown, Pa.; Bellevue Hospital Medical College, New York, 1872; aged 88; died, August 2, of a fractured femur received in a fall.

Hugo Kunz, New York; Bellevue Hospital Medical College, New York, 1893; member of the Medical Society of the State of Pennsylvania; aged 68; died, August 8.

William Fay Ross ⊕ Aspinwall, Pa.; Jefferson Medical College of Philadelphia, 1905; served during the World War; aged 57; died, August 16, of coronary occlusion.

Frederick Lincoln Clark, New Bedford, Mass.; Boston University School of Medicine, 1888; aged 73; died, August 30, in South Dartmouth of pulmonary tuberculosis.

William Owen Lawrence, Leeds, Ala.; Birmingham Medical College, 1909; member of the Medical Association of the State of Alabama; aged 53; died, August 4.

Cephas Z. Wingerd, Sharpsburg, Md.; Jefferson Medical College of Philadelphia, 1874; aged 88; died, August 11, of cerebral hemorrhage and arteriosclerosis.

O. Eugene Larkin, Milton, Wis.; Chicago Medical College, 1884; member of the Illinois State Medical Society; aged 83; died, August 12, of coronary embolism.

Ashbel Fairchild Ruble, Wheeling, W. Va.; Eclectic Medical Institute, Cincinnati, 1894; aged 70; died, August 16, in the Ohio Valley General Hospital.

Sara Allen Castle, Meridian, Miss.; Woman's Medical College of Baltimore, 1900; Cornell University Medical College, New York, 1901; died, August 22.

Albert Edward Brown, Webster, S. D.; American College of Medicine and Surgery, Chicago, 1905; aged 75; died, August 4, of cerebral hemorrhage.

Edwin Augustine Swan, St. Petersburg, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1875; aged 83; died, August 15.

Benjamin Edward Selman, Silsbee, Texas; Memphis (Tenn.) Hospital Medical College, 1890; formerly county health officer; died in August.

Albert Douglas Miller, Humboldt, Iowa; State University of Iowa College of Medicine, Iowa City, 1912; aged 50, died, August 20, of heart disease.

Antonio de Robertis, Boston; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1892; aged 69; died, August 23, of myocarditis.

George Leonard Wagner, Deshler, Neb.; Cotner University Medical Department, Lincoln, 1914; aged 54; died, August 15, of myocarditis.

Nahum Kavinoky, Los Angeles; University of St. Vladimira Faculty of Medicine, Kiev, Russia, 1898; aged 62; died, August 4, of heart disease.

Eleanor I. Horn Parsons, Lake George, N. Y.; Bennett Medical College, Chicago, 1885; aged 75; died, August 17, of carcinoma of the bladder.

James Copeland Gibson, Jacksonville, Fla.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1896; aged 56; died, August 28.

Mary E. Donaldson Dennis, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1897; aged 68; died, August 27.

William E. Pittman, Roseville, Ill.; Rush Medical College, Chicago, 1885; member of the Illinois State Medical Society; aged 79; died, August 8.

Richard S. Wilson, Willshire, Ohio; Fort Wayne (Ind.) College of Medicine, 1891; aged 82; died, August 14, of carcinoma of the stomach.

Elizabeth Bartos ⊕ Cleveland; Western Reserve University Medical Department, Cleveland, 1924; aged 39; died, August 14, in Albany, N. Y.

Merritt Meade Hill, Elverton, W. Va.; Medical College of Virginia, Richmond, 1925; aged 37; died, August 31, of an overdose of a drug.

Isaac P. Poynor, Houston, Texas (licensed in Texas, under the Act of 1907); veteran of the Spanish-American War; aged 71; died, August 7.

Harry Y. Hartman, Orwigsburg, Pa.; Jefferson Medical College of Philadelphia, 1880; aged 81; died, August 18, of bronchopneumonia.

Bliss Adam Marven, Moncton, N. B., Canada; University of Vermont College of Medicine, Burlington, 1886; aged 76; died, August 22.

Nathan Absalom Arrants, Decatur, Tenn.; Vanderbilt University School of Medicine, Nashville, 1885; aged 81; died, September 24.

Joseph Salmon Marblestone, New York; University and Bellevue Hospital Medical College, New York, 1906; died, August 20.

Sarah Elizabeth Winter, Media, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1892; aged 69; died, August 22.

Elmer Julius Boeseke, Santa Barbara, Calif.; Chicago Medical College, 1889; formerly mayor; aged 70; died, August 25.

Herbert W. Allen, Glendale, Calif.; University of the City of New York Medical Department, 1883; aged 76; died, August 18.

William Shira, La Rue, Ohio; Bellevue Hospital Medical College, New York, 1877; aged 92; died, August 17, in Edgewood, Pa.

Robert H. Morrell MacKenzie, Pittsburgh; Baltimore University School of Medicine, 1898; aged 69; died, August 15.

Thomas M. Stapleton ⊕ Chicago Heights, Ill.; Chicago College of Medicine and Surgery, 1914; aged 53; died, August 9.

Eugene H. McCullers, Clayton, N. C.; Bellevue Hospital Medical College, New York, 1888; aged 74; died, August 14.

Fredrick Leonidas Smith, Eufaula, Okla. (licensed in Oklahoma under the Act of 1908); aged 70; died, August 22.

J. W. De Noon, Cedar Rapids, Iowa (licensed in Iowa in 1886); aged 86; died, August 7, of carcinoma of the cecum.

Thomas Oscar Young, Princess Anne, Md.; Jefferson Medical College of Philadelphia, 1880; died, August 3.

Mark Elbaum, Milwaukee; Rush Medical College, Chicago, 1937; aged 28; died, August 15, of tuberculosis.

Edward Plews Kermott, Glendale, Calif.; Rush Medical College, Chicago, 1886; aged 77; died, August 8.

Milton S. Kuhn, Mount Pleasant, Pa. (licensed in Pennsylvania in 1901); aged 81; died, August 14.

Correspondence

"COLD VACCINES"

To the Editor:—Referring to the article "Cold Vaccines: An Evaluation Based On a Controlled Study," in THE JOURNAL, September 24, may I point out certain defects in an evaluation based on the statistics gathered as reported?

1. The employment of respiratory group bacterial vaccines—loosely termed "cold vaccines"—for the purpose of protecting against the widely varying and innumerable primary causes of lesions of the respiratory mucosa does not accord with the immunologic principles involved.

2. The "stepping up in virulence," with increasing morbidity rates and with increasing mortality rates, due to bacterial diseases that are nearly always sequels to the milder respiratory disorders, is not considered in the evaluation—more particularly a virulence during the rapid spread of epidemic coryza and influenza.

3. The statement that "few studies of these vaccines have been adequately controlled" fails to consider the evidence, identical in large part, with statistics on pneumonia. For example: 1. Reports from the Commission on Pneumonia appointed by the Surgeon General of the U. S. Army during the apallingly fatal epidemic of 1918—statistics which were incorporated in the general order for vaccination of the entire troops. 2. The campaign to reduce the death rate of pneumonia in New York State, with the objects of reducing the incidence of pneumonia and of providing better treatment for patients, published in the Year Book of General Medicine, 1936, pages 184-185, for statistics by Felton, and pages 184-199 for evaluations by Cecil, Case and others.

G. H. FONDÉ, M.D., Mobile, Ala.

HUMAN REQUIREMENTS FOR VITAMIN B_1

To the Editor:—All those who are seeking to clarify the position with regard to human requirements for vitamin B_1 will appreciate Dr. Cowgill's timely and comprehensive summary.

Recent work from all quarters has tended to confirm Dr. Cowgill's original suggestion of 300 international units as a basal protective level for an "average man" weighing 70 Kg. who consumes 3,000 calories a day, and it would seem clear that additions to this must be expected for normal good health and in all conditions in which there is increased metabolism.

The 1935 publication of the Technical Commission of the League of Nations Health Committee, in which from 150 to 250 international units of vitamin B_1 was recommended as the requirement for pregnancy and lactation, naturally obtained widespread publicity, and Dr. Cowgill rightly points out that "such a recommendation seems altogether too low." The commission's attention has frequently been called to this fact, emphasis being laid on two points: first, that diets of such levels have been associated with beriberi, and, second, that the diets actually recommended by the commission do, in fact, contain considerably more vitamin B_1 than these figures represent.

It is noteworthy that in the most recent publication of the commission (June 1938) the recommendation has been altered as follows:

"*Vitamin* B_1.—As a result of considerable experience, an allowance of 10 international units per 100 calories of food-intake seems to be adequate. This allowance would place at 300 international units the daily requirement for an adult of 70 kilogrammes body-weight receiving a diet of 3,000 calories.

"The above estimate has been confirmed by consideration of the vitamin B_1 content of a large number of diets which protected human beings from vitamin B_1 deficiency, in contrast to others which did not provide such protection.

"The requirements of animals for vitamin B_1 have been shown experimentally to be greatly increased during pregnancy and lactation. Pending direct evidence, it is recommended that the diets of pregnant and lactating women should contain 2 to 3 times the minimum allowance for the adult in general. The quantities of vitamin B_1 recommended above would probably be contained in ordinary mixed diets when lightly milled cereals are a staple of the diet, or when milk, fruits and vegetables are freely used and highly milled cereals and sugars are not allowed to displace protective foods.

"The requirements of the infant for vitamin B_1 would appear to be met by about 10-15 international units per 100 calories of food-intake. An allowance of 200-250 international units daily is probably sufficient for nursery school-children."

Thus the minimum protective level suggested is now brought up to Dr. Cowgill's 300 unit level, and the quantities suggested for pregnant and lactating women are at least from 600 to 900 units. This would seem to be more nearly in line with the experimental and clinical data at present available.

AUDREY Z. BAKER, B.Sc., M.R.C.S., L.R.C.P.,
London, England.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MEDICINAL BATHS

To the Editor:—I should like to have an opinion on therapy of medical baths as practiced in Europe. Foreign physicians have apparently brought with them into this country the idea of medicinal baths; for example, the carbonic acid bath, the oxygen bath, the oxygen bath with iodide. I do not mean the natural spring baths so much as I mean the packaged chemicals which are used in a patient's home. Please discuss this subject.

M.D., New York.

ANSWER.—The exact sphere of usefulness of artificial baths modeled after natural therapeutic baths has not been determined. It would seem in many instances that medicinal baths play only a minor role in the therapeutic regimen of the spa. At the spa, change of environment, regulation of activities, modification of diet, change of climate and institution of therapeutic measures may all be factors in the beneficial effects which are obtained. When one attempts to reproduce the beneficial effects of spa treatment simply by adding certain chemicals to the water in the patient's own bathtub, little benefit results.

There are some physicians, however, who feel that artificial Nauheim baths may be of some value in the management of certain milder forms of cardiac decompensation. The so-called 'Sprudel' water of Bad Nauheim is a naturally warm, saline solution, highly impregnated with carbonic acid gas. The temperature varies from 86 to 93 F. One may add 32 ounces of sodium bicarbonate and 22 ounces of sodium acid sulfate to 40 gallons of warm water (86 to 93 F.) to produce an artificial Nauheim bath which will generate approximately 250 cc. of gas per liter of water. Any competent pharmacist can supply the physician with a formula for the chemicals to be used in preparing such a bath.

Though there is little information available on "oxygen" baths, there are certain natural waters in Europe which contain iodides and bromides. For example, the water at Woodhall spa in Lincolnshire, England contains 7.68 mg. of potassium iodide and 50 mg. of potassium bromide per liter. Iodides and bromides are present in minute quantities in many "muriated" waters. Such baths could be produced artificially but there is so little evidence that these substances in minute quantities are of value that there seems no reason to add them.

It is unquestionably true that American physicians have paid insufficient attention to their own natural spas and that they are not nearly as conscious of the value of spa therapy as are European physicians. Nevertheless, the attempt to produce artificial mineral waters for use in the patient's home seems a dubious procedure at the very best. Because the skin is incapable of any great amount of absorption, medicinal agents incorporated in baths produce little or no therapeutic effect. One may therefore conclude that, while the natural spa regimen may be of considerable value in the management of certain diseases, due essentially to environmental conditions, artificial medicinal baths, for home use, on the other hand, have an extremely limited field of usefulness.

PEPTIC ULCER AND SERORESISTANT SYPHILIS

To the Editor:—A white man aged 49 has a peptic ulcer, the diagnosis having been confirmed by x-ray examination. A routine blood Wassermann reaction was 4 plus. This was rechecked and the Wassermann, Kline, Kahn and Hinton reactions were all 4 plus. Antisyphilitic therapy was started March 22, 1938, and until May 20 the patient received ten weekly injections of bismuth in oil 1 Gm. and eight weekly injections of neoarsphenamine 4.05 Gm.. A blood Wassermann reaction May 27 was still 4 plus. From June 1 to August 2 the patient again received ten injections of bismuth in oil 1 Gm. and eight injections of neoarsphenamine 4.5 Gm. The blood Wassermann reaction August 6 was again 4 plus. The patient has been feeling fine and cannot recall when he became infected. A spinal tap has not been done yet. Can I give him a rest or shall I continue with the weekly injections of bismuth in oil and neoarsphenamine? Is it advisable to change to a soluble bismuth salt and to another arsenical, such as mapharsen? Is there any possibility of bringing the blood Wassermann reaction to negative with future treatment or is this case liable to turn out to be a Wassermann fast case because of the lack of early treatment? M.D., New York.

ANSWER.—As pointed out by Parsons, Plummer and Gaskill in THE JOURNAL June 11, 1938, page 1991, there is a high degree of frequency of association between peptic ulcer and syphilis of the central nervous system. In any patient with long-standing syphilitic infection, however, even in the absence of this association and even in the absence of obvious neurologic evidences of syphilis of the central nervous system, it is essential to test the spinal fluid as early as possible in the course of treatment in order to direct treatment intelligently. The character and amount of further treatment cannot be determined in the patient in question without this information. It is therefore undesirable to give him a rest period at the present time, but instead the spinal fluid should be tested promptly.

Whether weekly injections of a bismuth compound and neoarsphenamine should be continued or whether, on the contrary, the patient should now be treated with fever therapy, tryparsamide or both, or with some other trivalent arsenical drug, cannot be stated without information as to the spinal fluid reaction.

The possibility of reversal of the blood Wassermann reaction to negative cannot be definitely stated as to this particular patient. In general terms from 35 to 50 per cent or more of all patients with late syphilis are seroresistant under any form of antisyphilitic treatment. The relative importance of serologic reversal to the other aims of the treatment of late syphilis should, however, be kept in mind. In any patient with late syphilis the aims of treatment are four: 1. If lesions of syphilis are present or if the patient has symptoms attributable to syphiltic infection, treatment is planned to heal the lesions or to relieve the symptoms. 2. Treatment is continued past the point of symptomatic relief in order to prevent the development of progression or relapse in the future. 3. If no lesions or symptoms are present at the initiation of treatment, the entire course of treatment is planned as prophylaxis for the future for the prevention of progression or relapse. 4. The least important element of the treatment of late syphilis is serologic reversal.

In connection with the problem of Wassermann fastness the inquirer should read the article by J. E. Moore and Paul Padget, The Problem of Seroresistant Syphilis, THE JOURNAL, Jan. 8, 1938, page 96.

DIET OF MOTHER DURING LACTATION

To the Editor:—There has been much discussion as to the foods nursing mothers can and cannot eat because of the effect on the baby. I have been unable to find any definite literature on this subject and should like to have a list of the foods which a nursing mother should not eat because of producing ill effects on the baby, such as colic.

M.D., Nebraska.

ANSWER.—For the average mother and the average baby there are no foods which need to be deleted from the diet because of producing ill effects on the baby such as colic. A mother may eat anything that agrees with her own digestion. A diet which is suitable for her under normal conditions will be suitable during the period of lactation except that she will need to take a somewhat larger amount. The mother's diet must be well balanced and must contain foods rich in vitamins such as milk, butter, eggs, leafy green vegetables and raw fruits. There seems to be no good basis for the idea that the nursing mother cannot take acid fruits, vegetables or salads. These are all good for her if they do not upset her digestion. There is no evidence that the taking of moderate amounts of alcoholic beverages, or of tea and coffee or smoking in moderation affects the character of the milk adversely, provided the mother herself is not affected. Occasionally highly spiced foods and condiments such as mustard, red pepper, vinegar, pickles and pepper soups may seem to cause distress in the infant. Also occasionally such foods as garlic, onions or asparagus, which give a distinct odor or taste to the milk, may cause infants to object. Occasionally also an infant may be allergic to one or more foods in the mother's diet, resulting in allergic manifestations in the infant. Certain laxatives taken by the mother may cause loose stools in the infant, as may certain laxative fruits. Cause and effect is the best way to determine the relation of a food to distress or colic in the baby. If the condition in the infant clears up when the food is eliminated from the mother's diet, that is proof. However, this rarely happens and it is doubtful outside of allergic infants whether a well rounded mother's diet has any deleterious influence on the nursing infant.

TREATED MOTHER AND CONGENITAL SYPHILIS—DANGER TO OBSTETRICIAN

To the Editor:—A woman, eight months pregnant, has syphilis. Her Wassermann reaction is still 4 plus. She has been given the routine bismuth, neoarsphenamine and mercury treatment since she was two and one-half months pregnant. Is there any possibility of the baby's having the disease? Is there any possibility of the obstetrician's contracting the disease if some blood or fluid should be squirted in the mouth or on an abrasion of the skin? How reliable is the Wassermann test during pregnancy?

M.D., Minnesota.

ANSWER.—According to various reports in the literature there is a chance that from 2 to 10 per cent of the children of women with syphilis who have been well treated throughout the pregnancy will manifest congenital syphilis. The amount and intensity of the treatment, the number and extent of the rest periods, and the time in the pregnancy at which treatment was instituted are factors which determine whether or not the child becomes infected. The likelihood that an obstetrician will become infected from blood or amniotic fluid of a patient of this type with syphilis, even though his skin is abraded, is remote. The reason for this may be summarized briefly as follows: The amount of treatment she has received would render her noninfectious, and latent syphilis is but slightly if at all infectious even when not treated. A properly done serologic test is just as reliable in a pregnant woman as in other patients with syphilis. Pregnancy does not produce falsely positive serologic reports if the serologic technic is efficient.

DERMATITIS FROM CEMENT

To the Editor:—Several of my patients have been employed unloading cement for years without any ill effects, but lately they have been unloading a different type of cement, which the laborer tells me is hot. These patients get a severe dermatitis of the arms and legs or any place where the cement touches them. The dermatitis starts with an erythema and an induration of the skin with pain and burning, followed by ulcerations. It is also irritating to the lungs. One of the patients came to have a severe bronchial pneumonia following the unloading of a carload of this cement. The cement is put out by the Universal-Atlas Cement Company, 208 South LaSalle Street, Chicago. Would you kindly inform me what the irritative factor in this cement would be? M.D., Minnesota.

ANSWER.—The principal raw materials used in the manufacture of hydraulic cement are limestone, chalk, shell, rock cement, clay, shale, bauxite and blast furnace slag. To these materials are added lime, if it is desired to have a quick hardening cement, or gypsum, if a slow hardening cement is desired.

The hygroscopic properties and the alkaline content of cement are the chief causes of its irritant action on the skin, although the grains of silica which it contains may also irritate the skin. When cement comes in contact with water or perspiration, the lime which it contains is slaked, generating heat and forming calcium hydroxide. The withdrawal of moisture from the skin and the resultant heat formation constitute the principal mechanism by which it causes dermatitis, although the calcium hydroxide formed by this reaction and the calcium silicate naturally contained in the cement also play a part in causing dermatitis by acting as solvents for the keratin of the skin. Long exposure to cement, even when the skin is comparatively free from moisture, will cause it to become dry, hard and thick. Such skin is likely to crack and fissure, and indolent ulcers may occur. Workers who perspire freely are more likely to acquire dermatitis from cement than those who do not. For this reason, dermatitis among cement workers is more common in hot weather than in cold. Cement also causes ulcers of the nasal and buccal mucous membranes.

Tomé Bona and Janvier in their article "A Contribution to the Study of Dermatoses of Cement" (*Budapest Sitzgungsber.* **13**:21, 1935) describe three types of skin lesions caused by cement: The first type consists of vesicles and pustules with edema on the hands and fingers and other exposed parts of the body; the second type consists of softening and thinning of the epidermis resulting in painful swellings, and the third type is hyperemia and folliculitis which usually occurs on the backs and upper thorax of workers who carry bags of cement on

their backs. They also describe lesions of the upper respiratory mucous membranes, especially the occurrence of ulcers of the mucous membranes of the cheeks.

The prevention of dermatitis among workers in cement manufacture consists essentially in dust control and cleanliness of the workers. Modern totally enclosed machinery and modern methods of ventilation with local suction vents over dusty processes, compulsory shower baths after work, and the daily change to clean work clothes are preventive measures to be observed in cement factories. The eyes can be protected by wearing goggles and by bathing them in a boric acid solution after work. The mucous membranes of the nose and throat can be protected by respirators. A mild boric acid ointment with a hydrous wool fat base can be inserted into the nostrils to prevent ulceration of the nasal septum. Concrete mixers and those required to unload cement should wear coveralls made of some material impervious to dust as well.

Various protective ointments may be smeared on the skin which may also aid in the prevention of dermatitis from cement. Plain talcum powder dusted on the skin from a convenient container before beginning work has also been found to prevent lime dermatitis.

Treatment of dermatitis among cement workers consists in taking the man off the job and applying mild palliative lotions or ointments until he recovers. Such workers who develop recurrent attacks on resuming work, or who have chronic eczemas, should be transferred to some other occupation.

There is no reason to believe that the cement put out by the Universal-Atlas Cement Company, 208 South LaSalle Street, Chicago, is materially different from other cements. It may be that the cement which the workers now handle and which causes dermatitis is a quick-setting cement and contains more lime than the cement they formerly handled, or it may be that the workers affected have become sensitized to lime, or that the dermatitis occurred at a time when the workers were perspiring more freely than usual.

NEUROSYPHILIS—ANAL CONDYLOMAS

To the Editor:—1. A man aged 48 was diagnosed at a hospital as having meningovascular syphilis. The blood Wassermann reaction was positive (75 per cent fixation), Kahn 4 plus and Rytz positive. Spinal fluid examination showed a slight increase in the amount of globulin, Wassermann test 100 per cent fixation in dilutions of 0.2, 0.4, 0.5 and 1 cc., and cell count 17 per cubic millimeter. He has been given fifteen weekly doses of tryparsamide 3 Gm. and bismuth salicylate in oil 0.13 Gm.; also he has been taking potassium iodide 2 Gm. daily by mouth. What are your suggestions for subsequent treatment? If placed on a routine alternating course of a bismuth compound and mapharsen, can this be instituted without a rest period? 2. A man aged 19 has moist condylomas on the anal region. He gives no history of chancre or secondary eruption. The Kahn test was 4 plus and the Laughlin agglutination test was strongly positive. He was given eight injections of mapharsen 0.06 Gm., followed by ten injections of bismuth salicylate in oil 0.13 Gm. This has been followed by two injections of mapharsen, the first 0.06 and the second 0.04 Gm. He reports chills, nausea and vomiting about two hours after these last two injections. Apparently he has acquired an intolerance to arsenic. What would be your suggested course of treatment? A blood test was taken at the time of the last injection of mapharsen; the report was Kahn and Laughlin reactions negative. The condylomas have not decreased in size or number with this amount of antisyphilitic treatment. Is there any other treatment of the condylomas? Would cauterization of them be advisable? As these lesions are still moist, because of their location would the patient's condition be considered contagious? Would a spinal fluid test be indicated in this case and at what time during the course of treatment?

M.D., Wyoming.

ANSWER.—1. The omission of signs and symptoms of neurosyphilis from the inquiry makes it impossible to classify the type of neurosyphilis. If the clinical manifestations indicate that involvement of the central nervous system has occurred, the continued use of tryparsamide and bismuth is warranted. A patient with the meningovascular type of neurosyphilis eventually may show predominant signs of tabes dorsalis or dementia paralytica; hence the treatment planned must be directed toward the prevention of the development of these manifestations of neurosyphilis. If a course of tryparsamide and bismuth is planned, it will be necessary to give approximately 100 injections of each drug in order to arrest the disease. Fever therapy will accomplish the same result in less than half the time. Accordingly, if after a fair trial (three courses of tryparsamide and a bismuth compound) the clinical and serologic response has been unsatisfactory, fever therapy should be given. The bismuth compound and mapharsen may be given in alternating courses without a rest period, although the therapeutic efficiency is less from this combination than from tryparsamide and bismuth, intraspinal treatment or fever therapy. In other words, a patient with meningovascular neurosyphilis needs more intensive therapy than that offered by mapharsen and preparations of bismuth.

2. This patient may have become intolerant to arsenic. However, before accepting this as a fact it would be advisable to use some other arsenical preparation. Neoarsphenamine or arsphenamine should be tried, a small amount of the drug being given and a larger dilution (20 cc. to 0.1 gm.) used, and the injection should be given slowly. The bismuth injections should be continued. The fact that the blood tests have become negative is not, of course, sufficient reason to discontinue treatment.

There are some paradoxical phenomena in this case report. It is difficult, for instance, to understand why the condyloma lata would not melt away under the amount of treatment given, especially since the serologic reaction has reversed to negative so rapidly. The lesions may be condylomata accuminata, not of syphilitic origin. If the lesions are condylomata lata, they are still infectious, of course, and the negative serologic reports are in error. Rather than cauterize the lesions now it would seem advisable to continue with treatment for the syphilis and observe the effect on the lesions in order to determine their exact nature. This patient should have a spinal fluid examination at this time.

ASTHMA

To the Editor:—A man aged 46 has had asthma for about two years; for the last year it has completely disabled him from work. Two sisters had hay fever. Two years ago he was having the attacks both day and night; he had one or two every day, the worst spells coming after retiring between 10 p. m. and 6 a. m. Usually the attacks appeared two or three hours after he went to bed. Examination showed numerous bilateral nasal polyps with both antrums cloudy. These polyps were removed and antrum operations were done on both sides. Since then the nose has been open, no polyps have reformed and there has been no discharge from the nose. The rest of his physical examination, including a roentgenogram of the heart and an electrocardiogram, was negative. Intradermal skin tests showed him sensitive to house dust, all the fall pollens, cotton, cat hair, dog hair, goat hair, mule and horse dander, goose and duck feathers, kapok, all fish and a few foods. All the offending agents possible were removed from his environment and his diet was changed. He was given thirty injections of a stock dust extract, which apparently helped him. (He can stay in the house now while sweeping is being done.) Last fall I started on a polyvalent extract of about ten fall pollens. To date he has apparently had no trouble from the pollens, while last year from the tenth of August to about the middle of October he had asthma continuously. He has changed to a straw bed and straw pillows with rubber coverings for both and for a few nights has slept without any covers. He has returned to work regularly, but almost every night he has an attack of asthma between 11 and 2. A peculiar feature is that he worked for about ten nights and had his attacks just the same. He states that they were not so bad, but he attributes this to the fact that he took epinephrine as soon as he felt the attack coming on, while at home, asleep, he never takes it until he has to. For six months now he has had attacks only at night. In addition to the substances mentioned he had about 200 other tests, all of which were negative.

M. W. HAWS, M.D., Fulton, Ky.

ANSWER.—Nocturnal asthma, with freedom during the day, is not uncommon. In fact, if asthma is mild it is usual to have attacks occur only at night. This does not necessarily indicate contact with an atopen in the bedroom. The cause for the greater susceptibility at night is not known. A number of explanations, as fatigue, postural effects, and changes in the autonomic nervous system (vagotonia), have been suggested as explanations. The occurrence of these attacks does indicate that the asthma has been only partially controlled. One may hazard an opinion that more intensive control of the atopic factors will probably lead to increased relief. While it may be difficult to do, it is neither impossible nor impracticable, if the illness warrants it, to remove completely all the offending environmental substances to which the patient reacts. Adequate measures should be taken to protect the patient from house dust especially. This substance originates primarily from deterioration of furniture stuffing and mattresses. The measures taken to cover the mattress and pillows are sufficient, if the covering does not leak through the seams. If upholstered furniture is present in the living room or bedroom, it must be replaced by cane or wooden furniture or furniture upholstered with horsehair. (Even patients sensitive to horse dander are not sensitive to horsehair after its preparation for use in furniture.) This furniture must contain neither cotton batting nor kapok Both cotton and kapok are potent antigens and may easily be overlooked in such obscure places as stuffed toys, cotton filled comforters, automobile upholstering and even the padding of clothes. The use of cottonseed oil, as in fried potatoes, bakery goods or mayonnaise, must not be overlooked. Similar care must be exerted in the elimination of the other atopens to which this patient reacts. In addition to these measures and the continued treatment with pollen, one might add house dust hyposensitization, since, in spite of the removal of house dust from the patient's home, the contact with it in ordinary social life may be sufficient to cause him trouble. The usual measures for symptomatic relief should be continued.

PROBABLE LESION OF SACRAL ROOTS

To the Editor:—A man aged 28 complains of excruciating pain of five years' duration, beginning in the left half of the penis and radiating to the left testicle and left hip joint. At the time of the pain a noticeable depression as well as marked sweating in the left half of the penis approximately one-half inch from the corona was noticed. A month before the onset the patient's foot slipped while he was fixing a shower and he landed flat on his back. He was momentarily stunned. His neck struck the side of a curved end of a washtub. There was numbness in the left leg for a month. The patient has seen many doctors. Cystoscopic examinations were negative. There was no history of gonorrhea or syphilis; all smears were negative as well as blood tests. Roentgenograms of the hip were negative; roentgenograms of the bladder and kidneys were negative for stones. The patient describes the radiating pain to the left testicle as a knot between the rectum and the testicles. What diagnosis can you offer?

H. J. VALENTA, M.D., Tonopah, Nev.

ANSWER.—The results of a neurologic examination including a careful sensory examination would be helpful. The areas involved would coincide with the second, third and fourth sacral roots forming the cauda equina or the sacral and pudendal plexus. Because of the history of injury and subsequent numbness of the left leg, one should rule out the presence of an organic lesion causing compression or irritation of the roots involved. A careful x-ray examination of the sacral and lumber spine should be made. A reverse Queckenstedt to rule out the presence of a blocking lesion should also be done. In the absence of any positive manifestation the most likely diagnosis would be a pudendal and testicular neuralgia, which is a rare condition and resistant to therapy.

Some of the procedures to be tried in therapy should be large doses of vitamin B, an epidural injection of from 10 to 20 cc. of 1 per cent procaine hydrochloride solution followed by from 50 to 100 cc. of physiologic solution of sodium chloride. If this is unsuccessful an injection of procaine hydrochloride into the sacral foramina of the involved roots may be tried. If this gives temporary relief, alcohol might be used in the same areas. In the absence of relief from any of these measures, surgical means might be necessary, such as cutting the involved posterior sacral roots or a chordotomy.

HYPOTONIC SOLUTIONS OF SODIUM CHLORIDE

To the Editor:—Can you give me any information concerning the result of treatment of encephalitis and other diseases as written up in a recent issue of *Collier's Magazine* and carried out by Dr. George M. Retan? One of my patients whose husband is suffering from the after-effects of this disease has asked me to give this treatment to him.

M.D., Massachusetts.

ANSWER.—Hypertonic solutions of sodium chloride have been used extensively in medicine for many different purposes and in the treatment of a variety of conditions. Hypotonic solution of sodium chloride, with which Retan reported such excellent results in acute anterior poliomyelitis, has not been used so extensively. An article in THE JOURNAL, June 1, 1935, advocated the use of such solutions in the treatment of some mental disorders such as dementia praecox.

There have been many studies in experimental physiology on the effects of hypotonic solutions, all of which suggest caution in their use even though much of the experimentation has been in vitro. The danger would seem to consist primarily in large amounts of hypotonic solutions which might lake the blood. No record of any confirmation of Retan's work has been obtained.

NO AUTOINTOXICATION FROM BREAST MILK

To the Editor:—1. Is there such a thing as autointoxication from breast milk in a nursing mother? 2. Could such a condition account for a high rise in temperature (105.4)? 3. What is the nature of the toxin produced, if any? 4. Should breast feedings be discontinued? Why? 5. What mode of therapy do you suggest?

M.D., New York.

ANSWER.—1. There is no such thing as autointoxication from breast milk in a nursing mother.

2 and 3. It was erroneously believed formerly that the establishment of milk secretion was accompanied by fever. The onset of puerperal fever on the third or fourth day, at about the time the congestion and enlargement of the breasts, at the beginning of lactation, takes place, gave rise to the belief that the congestion of the breasts caused the fever; hence the term "milk fever." There is, however, no inflammatory factor involved in this physiologic swelling of the breasts. No condition of lactation could account for a rise of temperature to 105.4 F. except an actual infection in the breast (mastitis) possibly leading to an abscess, or an infection elsewhere in the body. If occurring during the puerperium, puerperal fever or pyelitis must be seriously considered.

4. Breast feedings should be discontinued during a febrile period in the mother only if there is infection in the breast (mastitis) or if the mother's condition is critical or if she has some infectious disease.

5. The treatment of the fever depends on its cause. It is never due to autointoxication from breast milk.

SEROLOGICALLY LATENT SYPHILIS

To the Editor:—A white man aged 35 gives a history of having a chancroid infection in 1936. At that time the Kahn reaction of the blood was found to be positive and from September 1936 to February 1937 he received eighteen doses of neoarsphenamine 0.06 Gm. and twelve doses each of bismuth subsalicylate and mercury. This treatment consisted of an arm injection and a hip injection each week, ending with six extra hip injections. Several blood tests were taken and all were reported negative. The patient was advised to have a spinal puncture and if this was negative he could consider himself cured. However, spinal puncture was not done. A recent newspaper article convinced the patient that perhaps he was not cured. I saw him for the first time two weeks ago. Other than for the foregoing facts, the history was essentially negative. Physical examination and the blood Kahn, globulin and gum mastic tests were negative; the spinal fluid showed a cell count of 3. I have classified this as a case of serologically latent syphilis and in view of its short duration have suggested continuous treatment as for early syphilis along the lines suggested in the manual of information for physicians on the treatment of syphilis published by the American Medical Association. At the time of the chancroidal infection dark field examination of the lesion was positive for the spirochete of syphilis. The patient is opposed to so much treatment but I have refused any treatment that falls short of that outlined. I would appreciate your criticism of my plan of treatment and would welcome any suggestions.

M.D., Tennessee.

ANSWER.—The so-called 'chancroid' in 1936 was obviously seropositive primary syphilis, in view of the fact that dark field examination at the time was positive and the blood serologic test was positive. The treatment given from September 1936 to February 1937 was inadequate both in amount and in kind. With only this amount of treatment there is still approximately a 50 per cent chance that the patient is not "cured" and that subsequently, in spite of the fact that he is now clinically and serologically negative, he will ultimately have some form of progression or relapse. Under these circumstances he should receive one year of continuous treatment dating from this point, the treatment consisting of alternating courses of an arsphenamine and a bismuth compound by the system outlined by the Cooperative Clinical Group.

PREPARATIONS FOR TREATMENT OF MYCOTIC INFECTIONS

To the Editor:—Can you give me the uses of the following formulas in the Pharmaceutical Recipe Book (1936 edition)? Page 74: camphor 7.5, menthol 15, boric acid 15, sodium bicarbonate 15, alcohol 250, water a sufficient quantity to make 1,000 cc. Page 148: menthol in a fine powder 10, salicylic acid in a fine powder 10, petrolatum 980, to make 1,000. Menthol, camphor and eucalyptol ointment: menthol 8, camphor 8, eucalyptol 28, petrolatum 956, to make 1,000. Page 192: Conspergent powder with camphor and salicylic acid: camphor in a fine powder 30, salicylic acid in a fine powder 30, conspergent powder (R. B.) 940, to make 1,000. Is there any evidence in the past literature that these preparations have been used successfully or have clinically revealed some unusual success in the treatment of the mycotic disorders either of the hairy or of the glabrous skin, especially when either one of the preparations was used alone and not as adjuvant therapy with other forms of treatment?

DOUGLAS T. PREHN, M.D., New York.

ANSWER.—The Pharmaceutical Recipe Book is edited by a committee of the American Pharmaceutical Association and contains only formulas that have been thoroughly tried somewhere in the United States and have been proved effective. The one on page 74 of the 1936 edition is an evaporating lotion made more cooling and analgesic by the camphor and menthol. It would have little effect on the growth of fungi but might be used to counteract the itching and burning sensations and to reduce inflammation in fungous infections. The first formula on page 148, 1 per cent each of menthol and salicylic acid in petrolatum, might be used as a mild fungistatic. The second one on this page, 0.8 per cent of camphor and menthol and 2.8 per cent of eucalyptol in petrolatum, would have the same action. Probably the activity would vary with different organisms.

"Conspergent" is a word not in Webster's unabridged dictionary or in any other consulted but is evidently related to "consperse," a term used in entomology to designate "many spotted," derived from a word meaning "sprinkled." The conspergent powder mentioned is composed of 150 parts of boric acid, 350 parts of zinc oxide and 500 parts of purified talc. In short, it is a dusting powder. Camphor and salicylic

acid, each 3 per cent, in this would make a good preparation for use in cases of ringworm, particularly for use in moist situations, as between the toes. It would be mildly fungistatic.

All these preparations might be useful in the treatment of fungous infections of the surface of the glabrous skin and in tender hairy parts, as the axillas and pubic regions.

REDUCTION IN VISUAL FIELD FOR GREEN NOT SIGN OF FOCAL INFECTION

To the Editor:—During the last annual meeting of the Indiana State Dental Association Dr. Louis Hill of Los Angeles made the following statements: 1. In the presence of foci of infection anywhere in the body there is produced a reduction in the green field in the perimetry test. 2. The dentist should refer the patient to a competent optometrist for a perimetry test and if the optometrist found a diminution of the green field it meant "foci of infection." Then the optometrist should refer the patient back to the dentist for a thorough dental examination to see whether the focus is of dental origin. If the dentist could not find any dental focus he should refer the patient to a physician, who in turn would try to locate the focus. Dr. Hill pointed out that in this manner dentists, physicians and optometrists could work harmoniously in solving the problems of foci of infection. Dr. Hill also commented on a case in which the physician refused to be a party to such a scientific investigation, illustrating the lack of cooperation on the physician's part. I have investigated this idea, consulting some of the leading ophthalmologists at Indiana University School of Medicine, and they state that they are totally ignorant of the value of such a test for foci of infection. What is your opinion on the value of such a test?

JOHN W. GRAVES, M.D., Indianapolis.

ANSWER.—It is certainly not true that a reduction in the visual field for green indicates a focus of infection. Defects in the visual field result, of course, from a number of causes, and absorption from a focus of infection is not one of the more common of these. A record of the fields for color is a procedure depending in part on the subjective judgment of the patient and it is common to find the field for green reduced during the first examination of a normal person who later shows normal fields. If a patient should be referred to a physician with no other finding than a reduction in the green field as measured by an optometrist, he would be justified in trusting his own clinical judgment as to the necessity of a thorough search for foci of infection. It would be entirely misleading if a dentist, suspecting focal infection, should depend on perimetric examination to decide the matter.

PARALYSIS NOT RELATED TO THYROIDECTOMY

To the Editor:—A woman aged 56 had a thyroidectomy in 1936. About two weeks afterward the following symptoms appeared: difficulty in swallowing, loss of voice, saliva running from the mouth, drooping of the lower lip—a glossopharyngeal paralysis gradually growing worse. Could there be any connection between the loss of the thyroid and the subsequent paralysis?

M.D., California.

ANSWER.—It is obvious that no paralysis such as that described as having occurred in this patient could have been the result of an error described in surgical technic. One cannot be certain from the symptoms that the patient suffered from glossopharyngeal paralysis, as this is a rare condition and difficult to diagnose. In a woman of 56 it seems much more likely that there is a bulbar palsy or bulbar neuritis. The fact that it occurred two weeks afterward would speak for thrombosis of some small vessel in the pons. One should consider the remote possibility of metastasis from a malignant thyroid, although such metastases are extremely rare in the brain.

ENDOTHELIOMA OF PLEURA

To the Editor:—I should appreciate information on endothelioma of the pleural cavity.

M.D., Ohio.

ANSWER.—Endothelioma of the pleura is a malignant tumor originating from the endothelial covering of the pleura. It may be limited to the costal pleura. It forms tumorous masses over the pleural cavity, which may be recognized radiologically after pneumothorax has been done. The main clinical feature is the development of an exudate, which is in most instances hemorrhagic. The presence of a hemorrhagic exudate is always suggestive of either neoplastic metastasis to the pleura or primary endothelioma of the pleura. The clinical symptoms are those of a pleurisy, particularly in the early stages, with pain which improves with the formation of an exudate and reappears after tapping. The exudate usually reappears rapidly after thoracocentesis. The treatment is mainly limited to palliative procedures. Irradiation sometimes retards the reappearance of the exudate but as yet has not produced a cure.

TEMPERATURE RECORDING WITH A STANDARD THERMOMETER

To the Editor:—In taking temperature with the ordinary thermometer, which is usually standardized for one minute, one reading is obtained when it is left in the mouth for one minute and another reading, usually half a degree higher, on waiting three minutes. It has always been my impression that these thermometers are standardized to one minute and that the correct way to take the temperature is to leave it in the patient's mouth one minute. If it is left in for three minutes, a considerable discrepancy occurs. Which method should be used to obtain the corrrect body temperature?

M.D., California.

ANSWER.—To get the true temperature reading a clinical thermometer should be left in the patient's mouth at least three minutes; five minutes would be better. This is the opinion of the Bureau of Standards.

A general statement cannot be made as to the length of time necessary for any clinical thermometer to give a true temperature reading. The time varies with the thermometer used and with the conditions of the patient's mouth at the time. Obviously, in some cases one minute might be enough. However, the only way to be sure is to try a longer time. If the reading of the thermometer goes up on the second trial, it is apparent that the time of the first trial was not long enough. The length of time should be increased until the reading does not change with the increase of time.

PROSTATIC CONGESTION AND ORGASM

To the Editor:—A man aged 34, married and the father of four children, has a negative venereal history and is in excellent general health except for a spastic descending colon. He has a disturbance of the orgasm. At 17 in an effort to break the habit of masturbation he held back the ejaculation (masturbatio incompleta). He states that at these times the ejaculate consisted of a small amount of jelly-like material. Shortly afterward came his first intercourse, when he says he was left wondering whether he had completed the act. In this case and in all intercourse since, the ejaculate has consisted of a small amount of thick colorless material and the sensation has been that of an uncompleted act. He says that the ejaculation is not premature as to time consumed and that at the onset of intercourse, in which he indulges once or twice a week, the organ is rigid and normal and remains so until the act is completed, when it gradually becomes flaccid. The chief unusual feature of this case is that nocturnal emissions are normal and that it is at this time only that the orgasm is complete. Prostatic massage shows a gland normal in size and not unduly tender; the secretion shows 4 plus leukocytes and numerous clumps of pus cells. This condition has not improved with massage over a long period. Urethroscopic examination shows a normal posterior urethra. I have tried massage and silver instillations (Huhner), sedatives, stimulants and various gland preparations but all to no avail. As I see it, the ejaculation in this case consists of the emptying of the seminal vesicles alone without the prostate and other glands performing their parts of the act. Is such a condition possible and if so how can it be corrected?

M.D., Minnesota.

ANSWER.—If the examination of the prostatic urethra performed without the use of any local anesthetic showed a normal prostatic urethra without any congestion present, the case must be considered psychic in character and should be treated by a specialist in psychiatric conditions. Many urologists, however, employ as a routine a local anesthetic which has the effect of blanching the mucous membranes and may thus cause a congestion to be missed.

ACAROPHOBIA

To the Editor:—The enclosed samples are from the skin of a patient. I cannot vouch for the authenticity of these, as she brought them to the office; however, she has expressed small ones of similar appearance in my presence. For the last year she has had typical menopausal symptoms. These are under control with theelin; liver therapy has corrected the anemia. Her only physical abnormalities now are a moderate prolapse of the uterus, irregular menses and an occasional staphylococcic infection of the skin, scarcely enough to be called furunculosis. Repeated Wassermann tests have been negative; all laboratory tests for blood and urine are now normal. Symptomatically she says there is a crawling sensation in her skin and then these little black objects hop out. She says she also passes them vaginally and rectally. There is no evident skin lesion prior to the appearance of one of these objects on the surface. Crushed under a cover glass they appear to look like an amorphous sulfide. Is there a name for this condition or a cause? Any information will be appreciated.

M.D., Alabama.

ANSWER.—This patient has acarophobia, a psychic disorder in which the patient erroneously believes and maintains that the skin is contaminated by some parasite. This eruption is a part of the general group of cutaneous neuroses, a group of eruptions which have a variety of expressions of an abnormal psyche on the skin. These patients frequently present hyperesthesia in association with hysteria. Mental disorders and depressing mental influences play a certain part in the causation of this condition.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, Jan. 3-5 and June 20-22. Sec., Dr. J. N. Baker, 517 Dexter Ave., Montgomery.

ALASKA: Juneau, March 2. Sec., Dr. W. W. Council, Box 561, Juneau.

ARIZONA: *Basic Science.* Tucson, Dec. 20. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CALIFORNIA: *Reciprocity.* Los Angeles, Nov. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: *Basic Science.* Denver, Dec. 7-8. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DELAWARE: Dover, July 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 26-27. *Medical.* Washington, Jan. 9-10. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 14-15. Sec., Dr. William M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, June 20-22. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 13-14. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 North 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 6-8. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical (Regular).* Baltimore, Dec. 13-16. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, Dec. 13-14. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

NEBRASKA: Lincoln, Nov. 25-26. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. Fred E. Clow, State House, Concord.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 23-26. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity.* Raleigh, December. *Examination.* Raleigh, June 19. Sec., Dr. William D. James, The Hamlet Hospital, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 3-6. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 7-9. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science.* Oklahoma City, Nov. 30. Sec. of State, Hon. Frank C. Carter, State Capitol Bldg., Oklahoma City. *Medical.* Oklahoma City, Dec. 14. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 19. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

PUERTO RICO: San Juan, March 7. Sec., Dr. O. Costa Mandry, Department of Health, San Juan.

SOUTH DAKOTA: Pierre, Jan. 17-18. Director of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.

TEXAS: Houston, Nov. 14-16. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 14. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 14-16. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 3. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 10-14. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, November 5, page 1789.

Tennessee June Examination

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held at Knoxville, Memphis and Nashville, June 15-16, 1938. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and three candidates were examined, 100 of whom passed and three failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Howard University College of Medicine	(1937)	84.3, 84.9, 85.8,	87.3
Emory University School of Medicine	(1938)		85.8
Tulane University of Louisiana School of Medicine	(1938)	83.3,	84.2
St. Louis University School of Medicine	(1938)		84.7, 85.4, 86.3, 86.4, 86.6, 87.3, 87.7, 87.8, 87.9, 87.9, 88.2
University of Pennsylvania School of Medicine	(1937)		87.3
Meharry Medical College	(1935)		84.1, (1938) 80.6, 82.3, 82.8, 83.2, 83.8, 84.2, 84.4, 84.4, 84.6, 85.1, 85.2, 85.4, 85.5, 85.5, 85.5, 85.7, 85.7, 85.7, 85.8, 86, 86.2, 86.4, 86.6, 86.9, 87.3, 87.4, 87.6, 88, 88.7, 89.1, 89.2, 89.6
University of Tennessee College of Medicine	(1938)		83.5, 84.7, 85.2, 85.5, 85.5, 85.8, 86.4, 86.5, 87.2, 87.5
Vanderbilt University School of Medicine	(1938)		84.6, 84.7, 84.8, 85, 85.3, 85.3, 85.9, 86.1, 86.5, 86.5, 86.6, 86.7, 86.8, 87, 87.1, 87.1, 87.2, 87.2, 87.3, 87.3, 87.3, 87.5, 87.6, 87.6, 87.6, 87.7, 87.8, 87.9, 88, 88.1, 88.1, 88.3, 88.4, 88.6, 88.7, 88.8, 88.8, 89.8

School	FAILED	Year Grad.
Meharry Medical College		(1938, 2)
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1936)

Eight physicians were licensed by endorsement from June 2 through August 29. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Georgia School of Medicine		(1936)	Georgia
Rush Medical College		(1930)	W. Virginia
University of Illinois College of Medicine		(1931)	Missouri
Tulane University of Louisiana School of Medicine		(1928)	Louisiana
Johns Hopkins University School of Medicine		(1934)	Maryland
University of Minnesota Medical School		(1935)	N. B. M. Ex.
University of Cincinnati College of Medicine		(1935)	Ohio
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow		(1928)	N. B. M. Ex.

Delaware July Report

Dr. Joseph S. McDaniel, secretary, Medical Council of Delaware, reports the written examination held at Dover, July 12-14, 1938. The examination covered ten subjects and included 100 questions. A grade of 75 per cent in each subject was required to pass. Fourteen candidates were examined, all of whom passed. Five physicians were licensed by reciprocity July 19. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1937)	77.8
Johns Hopkins University School of Medicine		(1931) (1932) 78, (1936) 82.6	80.9,
University of Nebraska College of Medicine		(1937)	80.6
Columbia University College of Physicians and Surgeons		(1936)	80.3
Hahnemann Medical College and Hospital of Philadelphia		(1937)	84.6, 84.6
Jefferson Medical College of Philadelphia		(1936) 84, (1937)	80.6
Temple University School of Medicine		(1936) 82.8, (1937)	82.3
University of Pennsylvania School of Medicine		(1936)	80.3
University of Virginia Department of Medicine		(1937)	84.9

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine		(1926)	W. Virginia
Hahnemann Medical College and Hospital of Philadelphia		(1899)	Penna.
Jefferson Medical College of Philadelphia		(1926)	Penna.
Meharry Medical College		(1934)	Tennessee
Trinity Medical College, Toronto		(1895)	Penna.

Oklahoma June Examination

Dr. James D. Osborn Jr., secretary, Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma City, June 8-9, 1938. The examination covered twelve subjects and included 120 questions. An average of 75 per cent was required to pass. Forty-six candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Creighton University School of Medicine		(1938)	84*
University of Oklahoma School of Medicine		(1934) (1937) 80, (1938) 77,* 78,* 78.9,* 79,* 80,* 80,* 80,* 81,* 81,* 81,* 81.9,* 82,* 82,* 82,* 82,* 82,* 82.8,* 82.9,* 82.9,* 83,* 83,* 83,* 83,* 83,* 83,* 83,* 83,* 83,* 83,* 83,* 84,* 84,* 84,* 84,* 85,* 85,* 85,* 85,* 85,* 85,* 85.8,* 86*	84,

Sixteen physicians were licensed by reciprocity from June 13 through August 3. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1930)	W. Virginia
State University of Iowa College of Medicine		(1934)	Iowa
University of Kansas School of Medicine		(1934), (1935)	Kansas
Tulane University of Louisiana School of Medicine		(1926)	Mississippi
Johns Hopkins University School of Medicine		(1920)	Virginia
Washington University School of Medicine		(1927), (1934), (1936)	Missouri
Hahnemann Medical College and Hospital of Phila.		(1937)	Ohio
Vanderbilt University School of Medicine		(1937)	Tennessee
University of Texas School of Medicine		(1929), (1931)	Texas
Medical College of Virginia		(1931)	Virginia
University of Virginia Department of Medicine		(1933)	Virginia
University of Wisconsin Medical School		(1932)	Wisconsin

* License withheld pending completion of internship.

Book Notices

The Prevention of Puerperal Sepsis. By L. Colebrook, M.B. B.S., Hon. Director Research Laboratories, Queen Charlotte's Hospital, London. Antisepsis in Midwifery. By L. Colebrook and W. R. Maxted. With a foreword by Sir Comyns Berkeley, M.C., M.D., F.R.C.P. Reprinted from the Journal of Obstetrics and Gynaecology of the British Empire, Vol. XLIII, 1936, pp. 691-714. Paper. Price, $1. Pp. 109. New York, Toronto & London: Oxford University Press, 1938.

This booklet consists of reprints of the two articles whose titles appear in the caption. These articles were published in the *Journal of Obstetrics and Gynaecology of the British Empire* in 1933 and 1936. The authors express opinions which have been recognized and accepted by many observers since the time of Gordon, Semmelweis and Holmes. That puerperal sepsis is essentially a contact infection has been almost universally accepted. While some have stressed the possibility of so-called autogenous infection, most authorities have continued to believe that such infection is the exception and not the rule. That some variety of streptococcus is responsible for most of the fatal cases of puerperal infection has been known since the time of Pasteur. The authors have added further proof of the correctness of certain principles which have been established and practiced by many clinicians and in well conducted maternity hospitals. One great difficulty has been and still is that well known principles of prevention of this contact and wound infection have not been generally applied. The authors properly call attention to the many lapses in good surgical technic in obstetric practice. The proper use of asepsis in the preparation of the patient, the material and the personnel is essential, and its omission is serious negligence. The proper use of masks and gloves is part and parcel of good technic. The exclusion of carriers is vital for the welfare of both mother and baby. It is difficult for one grounded in the theory of asepsis to revert to the idea of reliance on chemical antisepsis. One should be open minded and cherish the hope that some chemical antiseptic will eventually be found which will maintain an aseptic field without interfering with the immune reactions of the tissues.

The authors seem to feel that iodine and the preparation of a xylenol derivative are efficacious in combating infection, especially that with hemolytic streptococci. One should hesitate to rely on either of these agents to the exclusion of other well established methods of securing and maintaining an aseptic field. The authors would doubtless be the first to sustain the argument for thorough obstetric technic and yet the summary of conclusions seems to be offering makeshift methods in obstetric practice. The suggestions that thorough washing of the hands, which cannot be done in three or five minutes, be omitted, that rubber gloves, water and utensils be sterilized by means other than boiling, savors of the makeshift. The surgical technic employed during labor and delivery should be the equivalent of that used in opening the abdomen.

The principles enunciated throughout the text are excellent and no one can fail to profit by careful study and the application of the procedures advocated. The authors are to be complimented on their contribution to this important aspect of preventive medicine.

Le traitement de la tuberculose pulmonaire par la tuberculine. Par le Dr. M. Jaquerod. Paper. Pp. 43, with 2 illustrations. Lausanne: Librairie Payot & Cie. 1937.

This paper covered monograph in French summarizes Jaquerod's experiences and views on tuberculin therapy in general and particularly in pulmonary tuberculosis. His experiences date back as far as 1903 and were reported variously in 1905, 1909, 1912 and 1920 in the *Revue médicale de la Suisse Romande*. In the introduction he notes that viable bacilli and tuberculins (old tuberculin and bacillus emulsion) differ in action and briefly reviews the tuberculin treatment of pulmonary tuberculosis. The nature of tuberculin (old tuberculin and bacillus emulsion) and its toxic action is detailed, as well as the therapeutic action based on the conception of a toxic tuberculin reaction (the focal reaction) and an antituberculin immunization. Contraindications in certain types of tuberculosis, such as the danger of focal reactions in intestinal tuberculosis, are pointed out. In well chosen clinical cases, tuberculin treatment has a place, he believes. He employs it, beginning with very small but gradually increasing doses of old tuberculin and transferring to equivalent bacillus emulsion, when indicated, according to his scheme of therapy. The scheme of treatment is outlined generally and the cutaneous reactions are evaluated. All in all, whether or not one agrees with the theoretical basis of this treatment, one must admit that this report of thirty-five years' experience in treating selected cases of pulmonary tuberculosis, successfully in some instances as presented by a few selected cases, makes the monograph worth reading, if one is conversant with French. The presentation is to be commended for its sincerity and patient evaluation. The author is well known in the field of tuberculosis for similar monographs on allied subjects in this field.

Hibernation and Marmot Physiology. By Francis G. Benedict, Director, Nutrition Laboratory, Carnegie Institution of Washington, and Robert C. Lee. Carnegie Institution of Washington Publication No. 497. Paper. Pp. 239, with 11 illustrations. Washington, D. C.: Carnegie Institution of Washington, 1938.

A number of important conclusions are drawn from work reported in this volume: (1) that the respiratory quotient of the marmot gives no evidence of carbohydrate synthesis from fat; (2) that the metabolism in hibernation is qualitatively the same as in the fasting state; (3) that the metabolism is greater in hibernation than in cold-blooded animals of the same size; (4) that although carbon dioxide narcosis produces a state similar to hibernation, the authors believe the two are not identical; (5) that much work needs to be done to clarify the mechanism of hibernation. The merit in the work is mainly in repeating under conditions of careful control what had been done by other experimenters. The discussion is wordy and sometimes uncritical. For example they say "From our long experience in studying the effect of muscular activity of itself upon metabolism it is inconceivable to think that any appreciable percentage of the great increase in metabolism noted with the falling environmental temperature can be attributed to the relatively small increases noted in muscular activity. We are forced, therefore, to the conviction that in this case there is a true chemical regulation of heat production, i. e., an increase in heat production to combat the lower environmental temperature." This is in spite of the fact that no observations except by inspection were made of muscular movement. It is equally inconceivable that any one could determine by inspection whether shivering was or was not occurring to an extent sufficient to increase the metabolic rate. The authors' conclusion on this score seems highly debatable. The observations are carefully and completely recorded and the work is therefore of lasting value.

Nouvelle pratique dermatologique. Publiée par MM. Darier, Sabouraud, Gougerot, Milian, Pautrier, Ravaut, Sézary, Clément Simon. Secrétaire général, Clément Simon. Tome VI: Dermatose par carence. Atrophies et dystrophies. Tumeurs et naevi. Par P. Blum et al. Boards. Price, 300 francs. Pp. 954, with 269 illustrations. Paris: Masson & Cie, 1936.

The first forty pages in volume VI are devoted to the deficiency diseases. Nicolas and Massia under this heading group pellagra, the pellagroid erythemas and the pseudo-pellagras as the pellagra syndrome. This is followed by an article on beriberi and another on scurvy and on Barlow's disease (avitaminosis C).

Petges and his collaborators devote 197 pages to the cutaneous atrophies. Under the heading of vergetures are included all the various striae. Dermatite chronique atrophiante (Pick-Herxheimer) and anétoderma are discussed at length. The black and white and colored plates of the former could not be improved on. Poikiloderma has been the subject of so much discussion that any one especially interested in this disease would do well to read the exhaustive and authoritative treatment of this dermatosis by Gabriel and André Petges. This chapter is well documented and well illustrated. Particularly interesting are the roentgenograms of poikilodermatomyositis with calcareous concretions. The discussion of the differential diagnosis is a valuable contribution to the literature.

The melanosis of Riehl is treated at length by Petges and Lecoulant. In conclusion of the discussion on the pathogenesis they say "no pathogenesis is at present acceptable, one can make only hypotheses." The same authors also discuss the cicatricial atrophies of the skin. White spot disease is discussed by G. and A. Petges, and G. Petges and Lecoulant take up the senile atrophies and the colloid atrophies and the dystrophies. They

continue with the subjects of cutis laxa, elastic skin, pseudoxanthoma elasticum of Darier and epidermolysis bullosa.

Paul Blum follows with an excellent chapter on the keratoses. Particularly valuable is the differentiation of ichthyosis and érythrodermie congénitale ichthyosiforme.

Périn follows with an article on Darier's disease. The excellent clinical illustrations and photomicrographs together with the discussion and the bibliography leave nothing to be desired. The same author does just as well by parakeratosis of Mibelli.

In a short article with reproductions of three excellent photographs Gougerot and Carteaud give an excellent description of acanthosis nigricans and a differential diagnosis of that disease with the confluent papular papillomatosis, which they were the first to describe in 1928.

Primary cutaneous amyloidosis is beautifully presented with excellent illustrations by Nanta.

A noteworthy chapter of this volume is that of Périn on nevi, with an introduction by Darier. An interesting feature of this chapter is the inclusion of von Recklinghausen's disease in the nevus group. The hemangiomas and the lymphangiomas are included. The illustrations in color and in black and white are perfect.

A short article, well illustrated, on the benign epithelial tumors is contributed by Mlle. Dobkévitch. This is followed by an article on the cysts by Mlle. Eliascheff.

Woringer includes in his contribution the benign connective tissue tumors, myxomas, histiocytomas, lipomas, vaselinomas, paraffinomas, calcareous concretions, leiomyomas and dermatomyoma.

The remainder of the volume, 343 pages, is devoted to the precancerous dermatoses, epithelial tumors, sarcomas and the melanomas. Civatte opens the discussion with an exhaustive and beautifully illustrated presentation of the precancerous dermatoses. In the eighty-one pages allotted to him he takes up the subject of the etiology and physiopathology of these disorders. He continues with a scholarly dissertation on senile keratoses, xeroderma pigmentosum, Bowen's disease, erythroplasia, Paget's disease, érythro-kératodermies neviques précancéreuses and epidermodysplasie verruciforme. The subjects are presented from the histopathologic side with the expertness that we have come to expect from Civatte. Although the histopathologic illustrations are mostly drawings, nothing is lost and much is gained thereby.

Following the work of Civatte come ninety-three pages devoted to the malignant epithelial tumors by Favre, Josserand and Martin. All phases of the subject are taken up in detail. The clinical and histopathologic illustrations in color and in black and white are beyond criticism. Favre and Josserand continue with a masterly presentation of the cutaneous sarcomas and their treatment. The authors do not include Kaposi's disease in the sarcoma group but discuss it as a sarcomatosis or as an angiomatosis both with question marks. Woringer presents the melanomas and Lacassagne closes with a discussion of all phases of the treatment of cancer of the skin.

In this volume the same high standard of excellence as characterized the preceding volumes has been maintained.

Practical Otology, Rhinology and Laryngology. By Adam Edward Schlanser, M.D., Colonel, Medical Corps, United States Army. Cloth. Price, $4.50. Pp. 315, with 81 illustrations. Philadelphia: Lea & Febiger, 1938.

This little book, intended primarily for the army medical officer, is considered by the author also to have an appeal for the civilian practitioner because it is based on a peace time practice. Naturally when a book lays emphasis on its brevity and practicability it is to be expected that it will in large measure reflect the personal experiences of the author and this book is no exception. The danger, however, in this connection is that the author's likes and dislikes or his special predilections will receive undue emphasis. Most of the material presented in the book is accurate, concise and devoid of wearying technicalities, the approach being always from the clinical side. However, one cannot help but notice that whereas on the one hand a number of pages are given over to nasal deformities, a special topic requiring much more space than the author could afford to devote to it, on the other hand no mention is made of such important subjects as throat manifestations in connection with the various blood dyscrasias, the subject of sepsis due to ear, nose or throat infections, the subject of osteomyelitis and the role of physical therapy in otolaryngology. Nevertheless, despite these inconsistencies, the book will find favor particularly with army officers, to whom the author is well known for his long and admirable service in various important capacities.

Medizinische Praxis: Sammlung für ärztliche Fortbildung. Herausgegeben von Prof. Dr. L. R. Grote, Leitender Arzt der Medizinischen Klinik des Rudolf-Hess-Krankenhauses Dresden, Prof. Dr. A. Fromme, Direktor der Chirurgischen Abteilung des Stadtkrankenhauses Dresden-Friedrichstadt, und Prof. Dr. K. Warnekros, Direktor der Staatlichen Frauenklinik zu Dresden. Band XIV: Elektrokardiographie für die ärztliche Praxis. 15 Vorlesungen zur Einführung in die elektrische Untersuchungsmethode des Herzens und ihre praktischen Ergebnisse bei rhythmischem und arrhythmischem Herzschlag. Von Prof. Dr. Erich Boden. Fourth edition. Paper. Price, 10 marks. Pp. 192, with 104 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1939.

This little monograph, which has gone through four editions in six years, is intended for the general practitioner. There have been only a few changes from the third edition and these have concerned themselves chiefly with the section dealing with intraventricular block, which has been recast. The author has taken cognizance of the recent controversy regarding the terminology of bundle branch block, which was precipitated in America, and properly concludes that the evidence for the nomenclature of right and left bundle branch block is not convincing and of but little practical importance. He consequently has made use of the term unilateral bundle branch block of the common and uncommon varieties. He has also substituted for so-called arborization block the term bilateral bundle branch block. As in the past editions, the most instructive part of the monograph is its clear diagrams, which introduce the reader to the fundamental concepts in electrocardiography. Only two substitutions of electrocardiographic plates have been made, and the criticism directed at previous editions that the electrocardiograms are not always the most suitable still applies. It is unfortunate that the author has not altered the section on coronary artery occlusion and has ignored the use of chest leads in diagnosing this condition. Not enough stress is laid on the importance of the electrocardiogram in this disease. This section as a result is very unsatisfactory. This monograph can therefore not be as suitable as some of the others recently published.

Adventures in Respiration: Modes of Asphyxiation and Methods of Resuscitation. By Yandell Henderson. Cloth. Price, $3. Pp. 316, with 16 illustrations. Baltimore: Williams & Wilkins Company, 1938.

Whenever the word "adventures" appears in a title, the prospective reader fully relies on the author to produce engaging material. This book fulfils its title. It is replete with physiologic history, reminiscence and pertness combined with authoritative presentation of scientific investigations on respiration, asphyxiation and resuscitation. This is a book with flavor—Hendersonian flavor. Two synthetic quotations reflect the historical and reminiscent aspects of the book:

> On the morning of May 9, 1794, in the Palace de la Revolution in Paris, Antoine Laurent Lavoisier died under the guillotine. The Republic, it was said, had no need of scientists. As the sharp stroke of the guillotine severed his neck, there passed away from this world in his fifty-first year this master mind of science, who had done so much to draw aside from truth the veil of man's ignorance and wrong thought.
>
> In the second half of the nineteenth century, every young American physiologist aspired to round out his education by a year in Germany. There he experienced the masterly neglect of the German professors and learned that to pluck the fruit of learning from the highest branches one must climb the tree all by oneself, even if it is a tree that no one has ever climbed before. At home I met my "tree" immediately.

This book is a portrait of that tree. Combined with this sprightliness are many helpful facts, in twenty-seven chapters, on such topics as the fallacy of asphyxial acidosis, carbon monoxide asphyxia, mountain sickness and acclimatization, resuscitation of the newborn, the functional factor in pneumonia and failure of the circulation.

Characteristic of this able author, the book is pleasantly dogmatic. For instance, in the presence of recent publications alleging chronic carbon monoxide poisoning the author states that "there is no such condition as the expression chronic carbon monoxide poisoning would imply." Then with propriety he states that prolonged asphyxiation may lead to damage to the brain too deep for complete restoration, leading to survival, with impaired minds, loss of memory, paralyses or sensory defects. He states that claims of impaired health from exposure

to carbon monoxide should not be accepted as valid unless there is (1) at least 50 per cent saturation of the blood, (2) exposure of from three to ten or more hours and (3) continuous, complete unconsciousness, lasting for six to twenty-four hours after return to fresh air. While others may be disposed to recite experiences to the contrary, this author's assurance carries conviction.

This book may be read with profit by all persons from the high school student to the medical college professor of physiology.

Subacute and Chronic Pericardial and Myocardial Lesions Due to Non-Penetrating Traumatic Injuries: A Clinical Study. By Erik Warburg, M.D., Professor of Internal Medicine in the University of Copenhagen. With a short biography of Oluff Borch (Olaus Borrichius). By Torben Geill, M.D., Physician-in-Chief, de Gamles By, Copenhagen. Translated by Dr. Hans Andersen and Dr. Gerda Seidelin. Cloth. Price, 12s. 6d.; 14 kroner. Pp. 147, with 19 illustrations. London: Oxford University Press: Copenhagen: Levin & Munksgaard, 1938.

This monograph is an exhaustive study of traumatic myocardial disease. As the author states in the introduction, when the physician is faced with the problem of a patient that may have developed cardiac disease following a blow on the chest or other trauma it is difficult to find detailed knowledge of this subject in an ordinary textbook. For this reason a book of this type fills a long felt want. The first chapter consists of some remarks on the history and the delimitation of the subject. The historical aspect is particularly interesting, and Oluff Borch, whose biography constitutes a separate portion of the monograph, is a native of Jutland and a matriculate of Copenhagen and is given credit for publishing the first report of a case. In the succeeding chapters the author has collected and analyzed 197 cases from the literature and added six additional cases of his own. The conclusion at which he arrives from this analysis is that "if symptoms of cardiac disease occur shortly after a nonpenetrating trauma of the chest or even later (as a rule within a year) there is always a possibility that the pericardium or myocardium has been injured, causing subacute and chronic disease." One must agree with this statement and with his further plea that those hospital departments which receive a fair number of patients with traumatic lesions of the thorax should make a special effort to examine them systematically every day or every other day by physical examination, electrocardiography and x-ray photography. This monograph can be heartily recommended to any practitioner who may be confronted with a problem of this type.

A Text-Book of Pathology: An Introduction to Medicine. By William Boyd, M.D., LL.D., M.R.C.P., Professor of Pathology and Bacteriology in the University of Toronto, Toronto. Third edition. Cloth. Price, $10. Pp. 1,064, with 475 illustrations. Philadelphia: Lea & Febiger, 1938.

The first edition was published in 1932 and contained 906 pages and 287 illustrations; the third edition, with 1,064 pages, 459 illustrations and sixteen colored plates is an indication of the popularity of this textbook among medical students. As stated in the preface of the first edition, it is written with a single purpose, namely to enable the student to "gain a grasp of the fundamental principles of the subject" without dissipation of his energy in "intriguing rareties or the newest notion of the moment." Numerous paragraphs—in small type in the new edition—on the "relation of symptoms to lesions" demonstrates the "practical" value of pathology in diagnosis. The author's literary style is clear and concise, and by the use of apt allusions and deft turns of phrase the subject of pathology is made interesting, one might almost say entertaining. In addition to the increased number of illustrations, a mass of new material has been added. A section on sudden death is included for the first time. The anemias and pneumonias have been reclassified. The general discussion of viruses has been rewritten, and the virus diseases of the nervous system have been grouped in a manner to emphasize their relation to one another. Much new material is introduced into the various sections. The more important of these additions deal with experimental pulmonary embolism, direct observation of repair in living tissue, the method of bacterial invasion in typhoid, regional ileitis, the pathogenesis of acute pancreatititis and the life cycle of the Aschoff body. The inclusion of the results of recent investigations of inflammation, streptococci, the female sex organs and tumors add much to the corresponding sections. The rearrangement of various chapters is of interest. The first edition opened with the chapter on inflammation, which the author then believed "forms the best starting point for the study of patholgy as a whole." In this edition the subject of inflammation is relegated to chapter IV after the discussion of degenerative processes and circulatory disturbances. This is a more logical position. The author's presentation of pathology is frankly dogmatic. This method has certain virtues in a textbook for students. The known or established facts are presented; the uncertainties, while not ignored, are not emphasized. In determining the validity of facts for this purpose there may be differences of opinion. The author still accepts the explanation of Blake and Cecil of the pathogenesis of pneumonia. A single sentence is devoted to the work and opinion of Robertson, while the confirmatory experiments of Gunn and Nungester are not mentioned. While written primarily for medical students, this will prove useful to older practitioners of medicine and surgery. It presents pathology from the modern point of view in relation to the living patient. Any physician will find it a pleasant means of indulging "in the periodic brain dusting recommended by Osler."

Bolezni ukha, nosa i gorla: Rukovodstvo dlya vrachey. V. trekh tomakh. Tom pervy: Bolezni ukha. Chast vtoraya. Pod redaktsiey S. M. Kompaneytsa i A. A. Skrypta. [Diseases of Ear, Nose and Throat: Handbook for Physicians. Volume I: Diseases of Ear. Part 2. Cloth. Pp. 1,542, with illustrations. Kiev: Gosudarstvennoe Meditsinskoe Izdatelstvo USSR, 1937.

This is a voluminous work participated in by a large number of contributors under the editorship of S. M. Kompaneets. It is quite exhaustive, covering the field in all its aspects. A particularly commendable feature of the work is to be seen in its attention to the historical development of the specialty as well as a scholarly orientation in the universal literature of this field. A particularly interesting chapter is one dealing with otoneurologic syndromes accompanying the diseases of the central nervous system.

Erscheinungsformen der tuberkulösen Ersterkrankung der Lunge im späteren Schul- und Jugendlichenalter. Von Dr. med. H. Brügger, Direktor der Kinderheilstätte Wangen im Allgäu. Nr. 66, Tuberkulose-Bibliothek, Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Paper. Price, 7.20 marks. Pp. 34, with 46 illustrations. Leipzig: Johann Ambrosius Barth, 1938.

The illustrations are made from roentgenograms of the chests of older children and young adults. The author presents seventeen cases which have been carefully observed. He finds that a knowledge of the time when the individual first reacts to the tuberculin test is of the greatest importance in proving the development of first infection. In fourteen of his cases the first infection was found to follow precisely the same course in older children and young adults as in younger children; therefore he finds no special danger for those who are first infected in later life. He points out that if one depends for proof of first infection in later life on serial x-ray films only a few cases are proved. A series of tuberculin tests is necessary in the older ages; for example, on entrance into industry.

Der klinische Blick. Von Dr. Erwin Risak, Privatdozent für innere Medizin der Universität zu Wien. Second edition. Paper. Price, 6.60 marks. Pp. 226. Vienna: Julius Springer, 1938.

The author emphasizes the value of systematic and well trained clinical observation and points out that an observer will frequently be led by an apparently trivial finding to a correct diagnosis. The book is divided into three parts: A short discussion of the physician's physical senses, the information which may be gathered from the sickroom, and a more comprehensive presentation of what may be learned from the patient himself by physical examination, particularly inspection. The material is the fruit of the author's personal experience and of his contacts with his teachers and older practitioners. There are several defects in this volume, the most serious being overstatement and lack of balanced perspective. The seasoned clinician will be loath to agree with the author that a mere glance is sometimes sufficient to recognize early pregnancy before the patient has disrobed for examination and before she herself is aware of her condition. Nor is it easy to believe that feminine traits are frequently found in chronically constipated males.

Still more questionable is the example of a patient with a so-called thyrotoxic habitus who was warned by the author to refrain from using iodine. She continued in an apparently satisfactory condition until iodine was applied to her skin for some minor procedure. The result of this application of iodine was precipitation of fatal thyrotoxicosis. The experienced clinician can glean interesting information and different points of view but this is hardly a book to be recommended to any one who is not a discriminating reader.

Die Grundlagen der neuzeitlichen Tuberkulosetherapie im Rahmen der allgemeinen Therapie innerer Erkrankungen. Von Dr. med. habil. Werner Hollmann, Chefarzt der Abteilung für Innere- und Nervenkranke am Stadtkrankenhaus Brandenburg a. d. Havel. Mit einem Geleitwort von Dr. G. Schröder. Nr. 65, Tuberkulose-Bibliothek. Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker und Dr. Karl Diehl. Paper. Price, 9 marks. Pp. 100. Leipzig: Johann Ambrosius Barth, 1937.

The author discusses the treatment of tuberculosis in comparison with the development of medicine as a whole and divides tuberculosis therapy into five stages: (1) therapeutic methods on the basis of organic pathologic studies of the morbid course; (2) therapeutic methods on the basis of a single cause; (3) therapeutic methods on the basis of a pathologic-physiologic method of consideration; (4) the influence on tuberculosis therapy of functional-pathologic methods of consideration; (5) social and psychologic therapy of the tuberculous. This work has a bibliography but there are no illustrations. The presentation is a very general one and does not contain any particularly new material.

The Technique of Contraception: An Outline. By Eric M. Matsner, M.D. Foreword by Frederick C. Holden, M.D. Published for the National Medical Council on Birth Control, 501 Madison Avenue, New York. Fourth edition. Paper. Gratis. Distributed by the National Medical Council on Birth Control to Physicians only. Pp. 50, with 25 illustrations. Baltimore: Williams & Wilkins Company, 1938.

This is a pamphlet containing in rather concise form a statement concerning the most practical methods of contraception. The authors suggest for therapeutic contraception the prescribing of a mechanical barrier—a vaginal occlusive diaphragm (or cervical cap) to be used in conjunction with a spermicidal jelly or cream. It is pointed out that the method is not applicable to all cases. Alternative methods, when indicated, are generally those whereby spermicidal jelly is applied by means of a suitable applicator or the use of a condom.

Insulin: Its Production, Purification and Physiological Action. By Douglas W. Hill, B.Sc., Ph.D., and Frederick O. Howitt, M.Sc., Ph.D., F.I.C. Foreword by Professor E. C. Dodds. Cloth. Price, $5. Pp. 219, with 7 illustrations. New York: Chemical Publishing Co., of N. Y., Inc., [n. d.].

The English edition of this useful monograph was reviewed in THE JOURNAL, July 11, 1936. The work includes chapters on the pathologic physiology of diabetes mellitus, preliminary attempts to isolate the pancreatic hormone, preparation of insulin, purification of insulin preparations, the physical and chemical properties of insulin, the physiologic properties of insulin, the mode of action of insulin, the standardization of insulin preparations, and possible substitutes for insulin, with an extensive bibliography at the end of each chapter. Because of the vast amount of work which is constantly under way in the field of carbohydrate metabolism, any monograph such as this soon becomes out of date. This is strikingly evident in the book under discussion. It was published just at the time when protamine insulin and other slowly acting preparations were being introduced and a new edition would already seem desirable.

A Textbook of General Bacteriology. By Edwin O. Jordan, Ph.D. Revised by William Burrows, Ph.D., Assistant Professor of Bacteriology in the University of Chicago. Twelfth edition. Cloth. Price, $6. Pp. 808, with 197 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

Since the previous edition of this work the original author, Professor Jordan, has died. In the revision no essential change has been made in the organization of the book. The sections on oxygen supply and respiration, filtration and isolation of bacteria in pure culture have been rewritten. Extensive revision has been given to the part on viruses. The chapter on pathogenic protozoa has been brought down to date. This book is widely known.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Treatment with Herbs Constitutes the Practice of Medicine.—The state of Washington instituted proceedings in the superior court, King County, against the defendant Low, charging him with practicing medicine without a license, in violation of the state medical practice act, in that he "wilfully and unlawfully did practice and hold himself out as practicing medicine in this, that he . . . did treat and pretend to treat and heal one Pat Hughes for disease and physical condition, to-wit: by the use of drugs, medical preparations." Low was convicted and appealed to the Supreme Court of Washington.

At the trial, over Low's objection, copies of newspaper advertisements of the Sing Herb Company, which designated Low as the "Directing Herbalist" and announced free consultation and certain office hours, were admitted in evidence. The advertisements stated that "No matter with what you are afflicted, our wonderful herb treatment will positively relieve diseases," naming some twenty-nine diseases or complaints, and that "all disorders disappear without operation." The advertising account was carried in the name of the "Sing Herb Company, by H. S. Low." An investigator for the state testified at the trial that when he visited the address stated in the advertisements Low was referred to by himself and by an office girl as "the doctor." Low, after asking the investigator what ailed him and being informed that he had had a paralytic stroke, advised him to follow a diet set forth on a diet sheet which he gave him. Low also gave him two bottles of "medicine," which had typewritten directions on their labels, and advised him to take the entire contents of one bottle at once. The price for the medicine was to be $10 a week. Low assured the investigator that the "medicine" would help him if he followed directions and returned.

The Supreme Court could not agree with Low's contention that the superior court had erred in admitting in evidence the newspaper advertisements. In its opinion the investigator's testimony showed that Low was connected with the Sing Herb Company, so that the advertisements, which would otherwise have been inadmissible in evidence because no foundation had been laid for their introduction, were admissible to prove that the defendant was engaged in that particular character of practice of medicine which the state charged him with practicing. Likewise, the court was unable to agree with Low's further contention that the evidence was insufficient to sustain the conviction. It was undisputed that Low had called himself "the doctor." Certain of the advertisements announced "consultation free" and all of them emphasized that "our wonderful herb treatment will positively relieve" practically every disease of which medical science has any knowledge. Low diagnosed the case of the investigator to the extent of prescribing some liquid. What that liquid was made no difference and therefore it was not necessary for the state to have an analysis made of it. The court called attention to the fact that Low did not hold a license to practice any branch of the healing art and specifically stated that the question of whether an analysis of the "medicine" would be material if Low were licensed to practice in one of the restricted fields of the healing art was not before the court. In the judgment of the court, Low had held himself out as practicing medicine, without a license so to do.

Furthermore, the court was of the opinion that the superior court had not erred, as Low contended, when it incorporated in its instruction as to the meaning of the term "drug" only the last portion of the statutory definition set forth in the food and drug law of the state, which provides:

> "The term 'drug,' as used in this act, shall include all medicines and preparations recognized in the United States Pharmacopeia or National Formulary for internal or external use, *and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of disease of either man or other animals.*" [Italics supplied by court.]

Only the latter portion of the statutory definition, said the court, was applicable to the facts in the present case.

The Supreme Court affirmed Low's conviction but it reversed the judgment and remanded the case for resentence because the superior court had erred when it imposed a penalty of both fine *and* imprisonment when the statute authorized only fine *or* imprisonment.

In a special dissenting opinion, Chief Justice Steinert disagreed with the affirmation of Low's conviction, because, in his opinion, the copies of the newspaper advertisements were inadmissible in evidence and the state had failed to prove the charge in its complaint that Low had treated the supposed patient "by the use of drugs, medical preparations." The evidence showed only that Low supplied the investigator with a diet sheet and two bottles containing "herbs." No chemical analysis of the contents of the bottles was made. It was not shown, therefore, according to this dissenting opinion, that the "herbs" consisted of or contained drugs or medicinal preparations, and it cannot be presumed that they did. The chief justice also was of the opinion that the superior court, by limiting without qualification its definition of the term "drug" to the latter part of the statutory definition, gave the jury to understand that any substance or mixture of substances used as a cure or prevention of disease was a "drug." As thus defined the word "drug" would apply equally to any article of food or drink no matter how innocuous it might be. Under such a construction of the meaning of the term "drug," any one who should treat disease by a food diet or any form of drugless healing would be practicing medicine. In his opinion such a construction was untenable.—*State v. Low (Wash.), 74 P. (2d) 458.*

Workmen's Compensation Acts: Compensability of Death Following Inhalation of Ammonia.—On the morning of Feb. 10, 1935, Holmes, an engineer employed in the refrigerating plant of the defendant, was found lying on the floor a short distance from a broken pipe from which ammonia gas had escaped. After he had been carried outside and a gas mask he was wearing had been removed, he vomited. When he arrived at his home he had difficulty in breathing and coughed frequently. Later, to aid his breathing, it was necessary to prop him up with pillows. His appetite failed, he did not sleep well and his condition became progressively worse. He had to quit work on March 26, about which date he entered a hospital, but he returned home three weeks later. A few weeks thereafter he entered another hospital and there he developed pneumonia and died. The claimant, his wife, brought proceedings under the workmen's compensation act of Illinois against the employer. From a judgment of the superior court of Cook County affirming an award of the industrial commission in her favor, the company appealed to the Supreme Court of Illinois.

According to the record, except for a short illness in October 1934 Holmes had been in good health prior to the accident. A physician who treated him sometime after the accident in February 1935 testified that when he was summoned in the latter part of March 1935 Holmes had a bad bronchitis, a bad heart and diseased kidneys. He testified further that ammonia gas attacks the mucous membranes, causes irritation in the respiratory organs and results in a toxic condition. The coroner, a physician who had performed an autopsy on Holmes's body, testified that death was not due to the exposure to ammonia fumes. He was of the opinion that Holmes's heart, kidneys, bladder, prostate and spleen were diseased and that these conditions, together with the pneumonia, had caused death. The coroner, however, admitted that evidence that Holmes had been almost suffocated by ammonia so that he gasped for breath and was "knocked out" would make a difference in his opinion as to the causal connection between the exposure to ammonia gas and death. Another physician, in answer to a hypothetical question, testified that a causal connection existed between the exposure to ammonia gas and the subsequent condition of ill-being and death. In his opinion, the coughing, gasping and choking that appeared after exposure to the ammonia fumes were due to his heart condition as well as to the exposure to the fumes. He testified further that "an infection will result from exposure to ammonia and that the weakened condition of the person thus infected may result in such further infections as those Holmes was shown to have had in his urinary organs."

The findings of the industrial commission on contested issues of facts, said the Supreme Court, will not be set aside on appeal unless they are manifestly against the weight of the evidence. In the judgment of the court, it had been shown by competent evidence that Holmes had been exposed to free anhydrous ammonia, a dangerous gas, and that he was overcome and "knocked out" by the fumes. The court concluded that there was substantial evidence from which the industrial commission was justified in finding that Holmes sustained an accidental injury which arose out of and in the course of his employment and which later caused his death. Accordingly, the Supreme Court affirmed the judgment in favor of the claimant.—*Armour & Co. v. Industrial Commission (Ill.), 11 N. E. (2d) 949.*

When a Corporation Is Not Liable on Promise to Pay Hospital Bill.—Oddson, who had been at one time an employee of the defendant corporation, the Mackie Mill Company, was refused admission to a hospital in Seattle unless the hospital was paid in advance for its services. The president of the corporation wrote to the hospital that the corporation would pay Oddson's hospital expenses. Oddson was then admitted and cared for. The corporation, however, subsequently refused to pay the hospital for the services that it had rendered. The hospital then assigned to the plaintiff in the present case its claim against the corporation and he brought suit. The defendant corporation contended that its promise to pay could not be enforced against it, because that promise was ultra vires; that is, beyond the power of the corporation to make. The corporation contended that it was incorporated as a trading and manufacturing corporation and had no authority to become a surety or a guarantor of the debts of others. The trial court held that, although the promise to pay was ultra vires, the corporation was estopped from asserting that defense and entered a judgment in favor of the plaintiff. The corporation thereupon appealed to the Supreme Court of Washington.

The Supreme Court, with four judges dissenting, reversed the judgment of the trial court and ordered the case dismissed. The defense of ultra vires, said the Supreme Court, is not available to a corporation that has received, directly or indirectly, the benefits of an ultra vires contract, but if the corporation has received no benefits from the performance of such a contract it is not estopped from pleading that the contract was one beyond the power of the corporation to make. In this case the corporation received no benefit from the contract that it had made, involving the rendering of hospital care to a former employee. "To adopt a rule," said the court, "that would not allow the ultra vires defense would endanger the investments and savings of thousands of large and small investors who either own stock or bonds of a corporation. Such a rule would leave it in the power of managers or officers of large and small corporations to destroy the business of such corporations by making improvident contracts contrary to the business for which they were incorporated." The Supreme Court concluded that the contract signed by the president of the corporation was ultra vires, that the defense of ultra vires was available and that the corporation was not responsible for the guaranty.—*Millett v. Mackie Mill Co. (Wash.), 76 P. (2d) 311.*

Society Proceedings

COMING MEETINGS

American Society of Tropical Medicine, Oklahoma City, Nov. 15-18. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.

American Student Health Association, New York, Dec. 29-30. Dr. Ruth E. Boynton, Students Health Service, University of Minnesota, Minneapolis, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, Los Angeles, Nov. 30-Dec. 3. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.

Radiological Society of North America, Pittsburgh, Nov. 28-Dec. 2. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 3. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.

Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Southern Medical Association, Oklahoma City, Nov. 15-18. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., Dec. 6-8. Dr. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Western Surgical Association, Omaha, Dec. 2-3. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

16: 261-388 (Sept.) 1938

Effect of Excess Sugars on Perfused Rabbit Heart. A. J. Geiger and W. E. Hambourger, New Haven, Conn.—p. 261.

Hemodynamic Studies in Experimental Coronary Occlusion: V. Changes in Arterial Blood Pressure. L. Gross, G. Schauer and M. Mendlowitz, New York.—p. 278.

Bundle Branch and Intraventricular Block in Acute Coronary Artery Occlusion. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 283.

Form of Electrocardiogram in Experimental Myocardial Infarction: V. Later Effects Produced by Ligation of Right Coronary Artery. I. G. W. Hill, F. D. Johnston and F. N. Wilson, Ann Arbor, Mich.—p. 309.

Cardiac Output in Arterial Hypertension: Part II. Study of Arterial Hypertension Produced by Constricting Renal Arteries in Unanesthetized and Anesthetized (Pentobarbital) Dogs. D. V. Holman and I. H. Page, New York.—p. 321.

Human Autonomic Pharmacology: XVIII. Effects of Intra-Arterial Injection of Acetylcholine, Acetyl-Beta-Methylcholine Chloride, Epinephrine and Benzedrine Sulfate. A. Myerson, J. Loman, M. Rinkel and M. F. Lesses, Boston.—p. 329.

*Clinical Significance of Persistent Depression of RS-T Segment in Electrocardiogram. A. Selzer, London, England.—p. 336.

Further Observations on Apical Systolic Murmurs in Children. L. G. Steuer and M. H. Fineberg, Cleveland.—p. 351.

Pancreatic Necrosis Associated with Auricular Fibrillation and Flutter: Report of Case Simulating Coronary Thrombosis (Autopsy Findings). E. L. Dittler and T. H. McGavack, New York.—p. 354.

Significance of Depression of RS-T Segment.—Selzer examined 2,000 electrocardiographic curves taken in routine work in order to discover the incidence of a permanent depression of the RS-T segment. The electrocardiograms of 150 healthy persons between 15 and 40 years of age were also examined. It was found that both in the standard and in the chest leads the RS-T segment was almost invariably isoelectric. In the 2,000 electrocardiograms there were 178 instances in which a persistent depression of the RS-T segment was present. In fifty-six of these the depression was due to digitalis, and these records were excluded from further study. In the remaining 122 cases hypertensive cardiac disease was found responsible in sixty-nine, syphilitic aortic valvular disease in nineteen, nonsyphilitic aortic valvular disease in eight, coronary artery disease in seven, rheumatic mitral valvular disease in nine, cor pulmonale in four, congenital cardiac disease in one, infective endocarditis in one, myxedema in two and thyrotoxicosis in two. These figures reveal that a depression of the RS-T segment may occur in all types of cardiac disease, the distribution of cases corresponding roughly to the frequency of the disease in the material examined. The statement of many German authors that the depression of the RS-T segment is a specific sign of coronary insufficiency was not confirmed.

American Journal of Medical Jurisprudence, Boston

1: 1-72 (Sept.) 1938

The Medical Man on the Witness Stand. E. O'Dunne, Baltimore.—p. 1.

Blood Groups in Disputed Paternity. M. Pijoan, Boston.—p. 5.

What Constitutes Body Attack in Medical Practice? H. V. Barbour, Detroit.—p. 9.

The Expert Witness and the Insanity Defense Plea. M. H. Hoffmann, Dearborn, Mich.—p. 12.

Interpretation of X-Rays in Court Hearings. L. H. Garland, San Francisco.—p. 19.

Organized Society's Interest in Death. O. T. Schultz, Evanston, Ill.—p. 22.

Detailed Examination Required to Determine Whether Rape Has Been Committed. J. R. Garner, Atlanta, Ga.—p. 29.

Doctors, Juries and Judgments. P. E. Craig, Coffeyville, Kan.—p. 32.

Diagnosis and Treatment of Legal Congestion. A. Koerner, New York.—p. 34.

American Journal of Medical Sciences, Philadelphia

196: 461-608 (Oct.) 1938

*Mental Symptoms of Pellagra: Their Relief with Nicotinic Acid. T. D. Spies, C. D. Aring, J. Gelperin and W. B. Bean, Cincinnati.—p. 461.

*Studies in Alcohol: I. Diagnosis of Acute Alcoholic Intoxication by Correlation of Clinical and Chemical Findings. W. W. Jetter, Buffalo.—p. 475.

Id.: II. Experimental Feeding of Alcohol to Nonalcoholic Individuals. W. W. Jetter, Buffalo.—p. 487.

Red Cell Mass in Polycythemia in Relation to Diagnosis and Treatment. R. L. Haden, Cleveland.—p. 493.

*Use of Mapharsen in Treatment of Malaria. D. Goldman, Cincinnati.—p. 502.

Use of 2 (*p*-Aminobenzenesulfonamido) Pyridine in Treatment of Pneumonia: Preliminary Report. H. F. Flippin and D. S. Pepper, Philadelphia.—p. 509.

Partial and Complete Heart Block in Acute Coronary Artery Occlusion. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 513.

Kidney Function and Uremia in Renal Amyloidosis. M. F. Mark and H. O. Mosenthal, Staten Island, N. Y.—p. 529.

Diabetes Insipidus with Big Bladder (Capacity Two Liters). E. Rixford and H. Gray, San Francisco.—p. 540.

Syndrome Consisting of Affections of Kidney, Stunted Growth, Rickets and Disturbed Cystine Metabolism. G. O. E. Lignac, Leiden, Netherlands.—p. 542.

Study of Silicosis. P. B. Matz, Washington, D. C.—p. 548.

Contralateral Spontaneous Pneumothorax Complicating Artificial Pneumothorax: Report of Two Cases. J. B. Andosca, Boston.—p. 559.

Role of Cervical Nerves in Facial Sensations and Quantitative Disturbance of Sensitivity in Major Trigeminal Neuralgia. F. H. Lewy, Philadelphia.—p. 564.

Pathologic Considerations of Thoracic Duct. R. N. Washburn, Rochester, Minn.—p. 572.

Mental Symptoms of Pellagra.—Spies and his colleagues observed sixty pellagrins with acute psychoses and other manifestations of pellagra, fifteen other pellagrins with no mental symptoms but with characteristic dermatitis, glossitis, stomatitis and gastrointestinal involvement, 424 patients with subclinical and mild pellagra who have been subject to one or two annual recurrences of the disease, twenty-six patients with psychoses of other types and 129 pellagrins who had had one or two recurrences of their "neurotic" symptoms each "pellagra season" since the onset of their disease. Patients with subclinical pellagra are noted for the multiplicity of their complaints, among which are many that are usually classified as neurasthenic. The most common of these symptoms are fatigue, insomnia, anorexia, vertigo, burning sensations in various parts of the body, numbness, palpitation, nervousness, a feeling of unrest and anxiety, headache, forgetfulness, apprehension and distractibility. The conduct of the pellagrin may be normal; but he feels incapable of mental or physical effort, even though he may be ambulatory. The studies suggest that nicotinic acid in adequate amounts is a specific therapeutic agent for the acute mental symptoms of pellagra. Both spontaneous and induced psychoses of pellagra respond promptly to this therapy. Coramine, the diethyl amide of nicotinic acid, also is beneficial in the treatment of the abnormal mental symptoms. The psychoses present in twenty-six nonpellagrous persons did not improve after the ingestion of these drugs. The so-called prodromal or neurotic symptoms of pellagra usually disappear following the administration of nicotinic acid. The studies were conducted in such a manner that suggestion was eliminated, and they indicate that the vague, subjective, prodromal symptoms are evidence of disordered function. Frequently repeated large doses of nicotinic acid prevent the development of mental symptoms in patients with subclinical and with mild pellagra. The minimal dose of nicotinic acid has not been determined but seems to vary from case to case. It is tentatively recommended that each patient with severe mental symptoms receive a total of at least 500 mg. daily. It is preferable to give this in ten doses. In the extremely severe cases convalescence seems to be shortened by the administration of 1,000 mg. daily. Since nicotinic acid is only one of the essential chemical substances present in the well balanced diet, all patients with pellagra should be given a well balanced diet whenever possible, even though nicotinic acid is used as a supplement.

Acute Alcoholic Intoxication.—In order to correlate the clinical observations of acute alcoholism with the concentration of alcohol in the blood and urine, Jetter studied 1,159 patients admitted to the Buffalo City Hospital with a diagnosis of acute alcoholism. The alcohol content of the blood and urine was determined by the method devised by Heise in 1934. Definite criteria were adopted for the clinical diagnosis of acute alcohol-

ism. Abnormality in gait was required as an absolutely essential finding in association with any two of four other changes: abnormality of speech, alcoholic odor of breath, flushed face and dilated pupils. In the determination of incoordination of locomotion, gross swaying, staggering or reeling must be present. Blood was obtained for analysis from 1,150 patients: 1,000 were alcohol positive and 150 alcohol free. In 372 of the 1,000 subjects showing alcohol in the blood, the urine was also obtained for analysis. Of the 150 individuals who were free of alcohol at admission, seventy-eight were known chronic alcoholic addicts. Various conditions may be confused with acute alcoholism particularly if the patient is comatose, which condition was present in thirty-seven cases. Of these, sixteen resulted from overdosage of either paraldehyde or barbital derivatives, while diabetes mellitus, uremia, cerebral injuries, cardiovascular accidents and schizophrenia accounted for nearly all others. The remaining thirty-five, occurring in nonalcoholic persons, were admitted in a noncomatose condition. An alcoholic odor was present in 903 of the 1,000 patients. Abnormalities of gait and speech were found in 750 and 721 cases, respectively. In most instances, abnormality of speech accompanied an abnormality of gait. The incidence of dilated pupils closely followed, occurring in 713 cases, while that of flushed face was lowest with a total of 606 cases. Alcohol was found in the urine of 381 persons, all but nine of whom were included in the group of 1,000 cases showing alcohol in the blood. An analysis of the 1,000 cases showing alcohol in the blood was made with regard to the occurrence of clinical criteria at the various alcoholic concentrations. With an alcohol concentration of from 0.05 and 0.1 per cent, abnormalities of both gait and speech were present in less than 20 per cent of the cases, at 0.15 per cent the percentage was approximately 40 and at 0.2 per cent approximately 80. The percentages gradually approached 100, which occurred in the group with a concentration of 0.45 per cent of alcohol. In most instances, abnormality of gait occurred slightly more frequently than did abnormality of speech. The incidence of alcoholic odor was high at all concentrations of alcohol, never dropping lower than 73 per cent at group 0.05 per cent of alcohol. The incidence of dilated pupils and flushed face did not follow the curve representing the incidence of clinical intoxication. While the incidence of both these criteria rose somewhat with increasing concentrations of alcohol (approximately 80 per cent in groups 0.3 and 0.35 per cent of alcohol), their percentage occurrence decreased with still higher levels. Of the 381 cases showing a positive test for alcohol in the urine, 372 were included in the 1,000 cases in which alcohol was found in the blood. No instances were observed with urine positive for alcohol and the blood negative or vice versa. The urinary concentration of alcohol was usually higher than that in the blood. The average ratio of the alcoholic concentration of the blood and urine in these 372 cases was blood to urine as 1 : 1.23. No person showed a concentration above 0.5 per cent of alcohol in the urine. An analysis of the urine series in respect to the occurrence of clinical criteria at various groups of alcohol concentration closely follow the incidence of clinical intoxication.

Mapharsen in Malaria.—Goldman began to use mapharsen in the treatment of therapeutic malaria in 1937. He also used it in a naturally occurring case of chronically recurring malaria of about eight months' standing. Its administration in malaria differs in no way from that used in syphilis. In most cases (more than 90 per cent of twenty-four cases), a single injection suffices to terminate the malaria permanently, but to obviate recurrences it is well to give three or four injections at the proper intervals. In therapeutic malaria as usually employed for dementia paralytica a course of from eight to ten injections will usually be given for the sake of its antisyphilitic value and at the same time the malaria is permanently eradicated. Mapharsen has been found to be much less toxic in debilitated patients than neoarsphenamine or even quinine. It also seems safer to use than atabrine. No toxic manifestations have occurred. Even malaria associated with severe leukopenia responded favorably and with an increase in the leukocytes. Recurrences after mapharsen are rare and are encountered only in severe cases which in this series (two) were believed to have been allowed to run longer than was advisable. The disappearance of the parasites is almost immediate. After twenty-four hours it is only rarely that a disintegrating form can be found in the blood smears. Splenomegaly begins to disappear almost as rapidly. Usually within a day the spleen is appreciably smaller and within three or four days it has receded behind the costal margin. If a chill is to be expected in less than twenty-four hours it usually occurs in spite of the injection, but if the chill is not due for more than twenty-four hours or if the injection is given at the height of a chill no subsequent chill will occur. The efficacy of mapharsen has not been observed in estivo-autumnal malaria. It is most important to determine what effect if any it will have on the notoriously resistant gametocytes of malignant malaria.

American Journal of Public Health, New York

28: 1153-1268 (Oct.) 1938

Sylvatic Plague. K. F. Meyer, San Francisco.—p. 1153.
Contributions of Edward Jenner to Modern Concepts of Heart Disease. O. F. Hedley, Philadelphia.—p. 1165.
*Alum Precipitated Toxoid for Prevention of Diphtheria. A. S. Dean and S. Hyman, Buffalo.—p. 1170.
Present Status of Safety Education in Some Representative School Systems. J. P. Sullivan, Boston.—p. 1175.
Registration and Approval of Public Health Laboratories as Carried on in Connecticut. F. L. Mickle, Hartford, Conn.—p. 1185.
Development of International Cooperation Among the Health Authorities of the American Republics. H. S. Cumming, Washington, D. C.—p. 1193.
Positions and Rates of Pay in Public Health Agencies. A. J. Borowski, Washington, D. C.—p. 1197.
Trichinelliasis in San Francisco. M. Hobmaier and J. C. Geiger, San Francisco.—p. 1203.
Epidemic of Typhoid Fever Attributed to Salad Contaminated by Chronic Typhoid Carrier. P. A. Lembcke and P. Von Haesseler, Albany, N. Y.—p. 1212.
Dye Concentration in Culture Mediums Employed for Analysis of Escherichia-Aerobacter Members in Milk. H. D. McAuliffe and M. A. Farrell, State College, Pa.—p. 1217.
Bovine Mastitis: Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows. W. T. Miller and H. W. Johnson, Beltsville, Md.—p. 1222.
Inexpensive Method for Dehydration and Preservation of Complement and Other Biologic Materials. E. E. Ecker and L. Pillemer, Cleveland.—p. 1231.
Educational Qualifications of Subprofessional Field Personnel in Sanitation. W. S. Leathers, Nashville, Tenn.—p. 1233.

Prevention of Diphtheria.—Alum precipitated toxoid (meeting the standards of the National Institute of Health) was administered to 620 persons, of whom 442 were Schick positive and 178 had not been given the Schick test. Dean and Hyman state that one dose of 1 cc. of the material was injected subcutaneously on the outer upper part of the left arm. A nodule remained in the arm usually for weeks, but no undue reactions or abscesses were reported. At four, sixteen and twenty-eight months after the administration of the toxoid, Schick tests were given to as many as possible of the 620 persons who received the product. The procedure was the same as described for the preliminary intracutaneous test of susceptibility to diphtheria toxin. There were 401 persons given the Schick test at four months, 385 at sixteen months and 246 at twenty-eight months. Among 159 who were Schick negative four months after having received 1 cc. of alum precipitated toxoid, 152 remained negative twenty-eight months after they obtained the toxoid. The percentage is nearly as high, 94, among sixty-nine persons who were known to be Schick positive prior to the receipt of the precipitated toxoid and to have had no previous toxoid or toxin-antitoxin. Among seven persons Schick positive four months after receipt of 1 cc. of alum precipitated toxoid, five were Schick negative twenty-eight months after the injection of the toxoid. The results of the intracutaneous tests of susceptibility to diphtheria showed that at the end of four months from the receipt of the toxoid 175 of 204 of the persons tested were Schick negative, at the end of sixteen months 162 of 187 persons were Schick negative, and at the end of twenty-eight months ninety-eight of 110 persons were Schick negative. The increasing immunity with the lapse of time may be due partly to the late effects of the alum precipitated toxoid to Schick test toxin or to naturally acquired immunity. Of 140 Schick positive persons unsuccessfully treated with unmodified toxoid or toxin-antitoxin, 94, 90 and 98 per cent were Schick negative four, sixteen and twenty-eight months after receiving alum precipitated toxoid. The administration of alum precipitated toxoid to 178 persons who had not previously been given the Schick test and had not formerly received toxoid or toxin-antitoxin gave

Schick negative responses four, sixteen and twenty-eight months of 98, 98 and 95 per cent. Thirty-seven per cent of 466 persons in an epidemic area who had never had toxoid or toxin-antitoxin were found Schick negative.

American Review of Tuberculosis, New York

38: 399-530 (Oct.) 1938

Molecular Weight, Electrochemical and Biologic Properties of Tuberculin Protein and Polysaccharide Molecules. Florence B. Seibert, Philadelphia; K. O. Pedersen and A. Tiselius, Uppsala, Sweden.—p. 399.
Incidence and Control of Tuberculosis in High School Children. H. W. Hetherington, H. L. Israel and P. B. Kreitz, Philadelphia.—406.
Tuberculosis Studies in Tennessee: Roentgenologic Evidence of Tuberculous Infection in Relation to Tuberculin Sensitivity in School Children. R. S. Gass, R. L. Gauld, E. F. Harrison, H. C. Stewart and W. C. Williams, Nashville, Tenn.—p. 441.
Mass Case-Finding. A. B. Robins, New York.—p. 448.
Results of Treatment of Tuberculosis in the Negro. G. D. Kettelkamp, P. Murphy and D. Trumpe, St. Louis.—p. 458.
*Anemia of Pulmonary Tuberculosis. M. M. Braverman, Waltham, Mass.—p. 466.
Normal Sedimentation Rate in Open Pulmonary Tuberculosis. A. L. Banyai and Esther Caldwell, Wauwatosa, Wis.—p. 491.
Erythrocyte Sedimentation: Its Practical Value in Ambulatory Tuberculosis Clinic. H. T. Pessar and A. Hurst, New York.—p. 495.
Culture of Tubercle Bacilli: I. Effect of Sodium Hydroxide and Sulfuric Acid on Acid-Fast Variants of Homologous Strains and Influence of Hydrogen Ion Concentration in Different Mediums on Subsequent Growth. W. Steenken Jr. and M. M. Smith, Trudeau, N. Y.—p. 503.
Medium for Culture, Isolation and Dissociation of Tubercle Bacilli. W. Steenken Jr. and M. M. Smith, Trudeau, N. Y.—p. 514.
Tuberculoma of Lumbar Spinal Cord. E. Kupka and R. E. Olsen, Pontiac, Mich.—p. 517.

Anemia of Pulmonary Tuberculosis.—Braverman studied the anemia associated with pulmonary tuberculosis in 509 cases. The venous method of obtaining the blood was used. Sections of bone marrow were obtained from about 100 subjects at thoracoplasty and at necropsy. As the amount and chronicity of the pulmonary disease increase, the number, size and hemoglobin content of the erythrocytes decrease. The incidence of anemia increases to 46 per cent when the mean corpuscular hemoglobin concentration is also taken into account. The most common types of anemia encountered are hypochromia and microcytosis. In the routine care of most tuberculous patients, the correction of the sedimentation rate of the erythrocytes for anemia is not necessary unless the anemia is severe. The icterus index values drop, often close to two units, as the amount and severity of the pulmonary lesion increase. It is believed that there is a partial inhibition of hemoglobin synthesis with an increasing severity of the pulmonary tuberculosis. In the treatment of the anemia associated with pulmonary tuberculosis, ferrous salts are the most effective. It cannot yet be stated statistically that the patients who received iron therapy now have a better prognosis than those who did not. Clinically, the group treated with iron fared better symptomatically than the other group.

Archives of Ophthalmology, Chicago

20: 541-708 (Oct.) 1938

Physiologic and Clinical Ophthalmologic Problems in Relation to Individual Variability. A. Brückner, Basel, Switzerland.—p. 541.
*Nature of Filtrable Agent of Trachoma. P. Thygeson, New York, and P. Richards, Albuquerque, N. Mex.—p. 569.
Evaluation of Homatropine-Benzedrine Cycloplegia. H. F. Sudranski, Indianapolis.—p. 585.
Cataract Operation to Reduce Incidence of Prolapse of Iris. F. C. Parker, Norristown, Pa.—p. 597.
Induced Size Effect: I. New Phenomenon in Binocular Space Perception Associated with Relative Sizes of Images of Two Eyes. K. N. Ogle, Hanover, N. H.—p. 604.
Experimental Iontophoresis of Rabbits' Corneas: Report of Two Cases of Corneal Dystrophy with Treatment by Ionic Medication. S. G. Seech and W. L. Cooper, Los Angeles.—p. 624.
Inferior Iridotomy in Operations for Cataract on Eyes with Posterior Synechiae or Pupillary Membrane: Value of Operation. P. A. Chandler, Boston.—p. 641.
Results of Autotransplantation of Cornea into Anterior Chamber: Their Significance Regarding Corneal Nutrition. T. Gundersen, Boston.—p. 645.
Intern's Experiences with Verhoeff Method of Cataract Extraction. P. H. Case, Phoenix, Ariz.—p. 651.

Nature of Filtrable Agent of Trachoma.—Thygeson and Richards performed twenty-two filtration experiments on human volunteers, monkeys and baboons. Six active filtrates were obtained under conditions designed to insure maximal activity of the material to be filtered and minimal losses due to adsorption in the filter. Maximal activity of the trachomatous material was attained in five of the six successful experiments by using pooled epithelial scrapings from trachomatous Indian children (selected for activity). For the sixth experiment the material was obtained from an adult white person with acute trachoma. Since the available evidence now indicates that the agent of trachoma has an epithelial localization, the type of material utilized is probably important. The material yielding active filtrates contained substantial numbers of epithelial cell inclusions. On the basis of the observations it is believed that the elementary bodies of trachoma are virus bodies like those of psittacosis and inclusion blennorrhea and that they are similar, except in staining reactions, to typical virus elementary bodies, such as those of vaccinia, fowlpox and molluscum contagiosum. Belief that the elementary body of trachoma represents the morphologic unit of the virus of trachoma rests, in the authors' opinion, principally on the following observations: (1) the identity in morphologic structure and staining reactions of the bodies of trachoma with the similar bodies of inclusion blennorrhea and psittacosis, established virus diseases, (2) the presence of the elementary bodies in the lesions of trachoma with sufficient constancy to indicate etiologic significance, (3) the presence of elementary bodies in an infective filtrate, (4) their multiplication in new hosts (man and baboon) when transferred directly or after filtration and (5) their persistence in the lesions of trachoma throughout its period of activity. The elementary body of trachoma has, in their opinion, the essential properties of a virus and should be classified, for the present at least, as a filtrable virus. It does, however, differ from the typical virus elementary body (such as that of vaccinia) in the ease with which it stains and in its regular morphologic variation. In these respects it resembles Rickettsiae, particularly Rickettsia ruminantium of Heartwater.

Archives of Surgery, Chicago

37: 521-696 (Oct.) 1938

*Pathogenic Bacteria in the Air of Operating Rooms: Their Widespread Distribution and Methods of Control. D. Hart, Durham, N. C.—p. 521.
Acute Osteomyelitis of Long Bones of Adults. I. Zadek, New York.—p. 531.
Fibrin Stones: Report of Four Cases. C. D. Allen and J. W. Ragsdale, Memphis, Tenn.—p. 546.
Malignant Endometriosis of Ovary, Resembling Arrhenoblastoma: Report of Case in a Girl Aged Nineteen. C. R. Tuthill, Staten Island, N. Y.—p. 554.
Myoblastic Sarcoma of Urinary Bladder. E. F. Hirsch and B. M. Brown, Chicago.—p. 562.
Dead (Ox) Fascia Grafts in Tendon Defects: Experimental Study. E. D. Weinberg, Baltimore.—p. 570.
Congenital Anomalies of Genitalia Associated with Unilateral Renal Agenesis, with Particular Reference to True Unicornuate Uterus: Report of Cases and Review of Literature. H. B. Shumacker Jr., New Haven, Conn.—p. 586.
*Concentration of Procaine in Cerebrospinal Fluid of Human Being After Subarachnoid Injection. H. Koster, A. Shapiro and A. Leikensohn, Brooklyn.—p. 603.
Effect of Biliary Operations on Liver: Their Relation to Concentration of Bile Acids in Bile. H. K. Gray, W. L. Butsch and J. M. McGowan, Rochester, Minn.—p. 609.
Subacromial Bursitis: Clinical, Roentgenographic and Statistical Study. S. R. Rubert, Iowa City.—p. 619.
Endometriosis of Umbilicus: Vicarious Menstruation Following Hysterectomy. R. Boggs, New York.—p. 642.
Vaginal Hernia: Review of Literature. W. E. B. Hall, St. Joseph, Mo.—p. 651.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Conor, Chicago.—p. 667.

Pathogenic Bacteria in Operating Rooms.—Hart asked fifty surgeons in twenty-five states to make cultures in the operating rooms in which they worked, in order to determine the extent and degree of the bacterial contamination of the air. Reports were received from thirty-two surgeons, covering thirty-seven operating rooms in thirty-three hospitals located in seventeen states. Exclusive of bactericidal irradiation, air conditioning is the most important single means of reducing the bacterial content of the air in the occupied operating room. The organisms in the outside air (predominantly nonpathogenic;

spores, gram-negative bacilli and fungi) are removed by the air conditioning system. The organisms given off in the room by the occupants (predominantly pathogenic; staphylococci and occasionally streptococci) are removed more rapidly by the clean, circulating air from an efficient ventilating system. Other things being equal, the number of pathogenic bacteria in the air of a room increases directly with the number of occupants and the duration of their occupancy. Conversely, the bacterial count drops directly in proportion to the length of time the room is unoccupied and closed. A canopy over the sterile supply tables is of some value in cutting down the contamination of these supplies. Only one report made any reference to the prevalence of infections of the respiratory tract. With four occupants of the operating room suffering from colds, Petri dishes of blood agar exposed for one hour showed an average of 13.8 colonies of streptococci per dish. Only this report stated that an appreciable number of the organisms were in the air. The concentration of Staphylococcus aureus in the air of the operating rooms at Duke Hospital is proportional to the number of carriers present. In one hospital during the three weeks covered by the test, with heavy sedimentation of Staphylococcus aureus from the air; three wounds were infected with this organism. The total number of colonies of bacteria sedimenting from the air gives some idea of the degree of contamination of the air but is of less significance than the number of pathogenic organisms present. The majority of the pathogenic bacteria reported were staphylococci. In the author's experience more than 90 per cent of infections of wounds are caused by staphylococci. He is convinced that in most cases the infection is caused by dropping of the organisms in the air into the wound or on the sterile supplies that will enter the wound. Streptococci were recovered from the air in relatively small numbers. This may probably be accounted for by the relatively few carriers and the susceptibility of the organism to drying. The organism is probably present in the air of the operating room in large numbers during epidemics of infection of the respiratory tract. Infections of wounds have been traced to carriers of streptococci. During epidemics of influenza the streptococci most likely reach the wound and sterile supplies by way of the air. In the Duke Hospital, by sterilizing the air with bactericidal radiation, it has been possible to get an operative field from which less than one colony to a Petri dish per hour of exposure can be cultured. With this technic, unexplained infections in primary clean incisions have practically disappeared, the postoperative course is smoother, elevated temperatures are less frequent and of shorter duration, the wound is less sore and the general systemic reaction is milder than when radiation is not used.

Procaine in Cerebrospinal Fluid After Injection.—Koster and his associates studied the concentration of procaine hydrochloride in the cerebrospinal fluid of 122 adult patients. Each patient received an injection of 150 mg. of procaine hydrochloride dissolved in 3.5 cc. of cerebrospinal fluid at the interspace between the second and the third lumbar vertebra. The concentration of the anesthetic was determined up to ninety minutes after the injection: (1) at the site of injection in sixty cases, (2) three interspaces above the site of injection in forty and (3) in the cisterna magna in twenty-two. The data indicate that the injected anesthetic is distributed rapidly cephalad. The peak concentration reached at a particular level during anesthesia decreases rapidly in the cephalad direction, so that in the cisterna magna the concentration of procaine was never above 0.21 mg. per cubic centimeter, and in fourteen of twenty-two samples it was less than 0.02 mg. These studies do not support the assumption that the Trendelenburg position causes concentrated solutions of procaine to flow down to the cisterna as do colored solutions in inanimate models.

Bulletin New York Academy of Medicine, New York

14: 583-652 (Oct.) 1938

Studies on Cortical Representation of Somatic Sensibility. P. Bard, Baltimore.—p. 585.
Present Status of Gynecologic Endocrine Therapy. H. C. Taylor Jr., New York.—p. 608.
Pathologic Responses to Vitamin Deficiencies. G. Dalldorf, Valhalla, N. Y.—p. 635.
Our Vitamin B_1 Supply in Relation to Human Needs. R. R. Williams. —p. 641.

California and Western Medicine, San Francisco

49: 177-248 (Sept.) 1938

Use of Dogs in Developing Treatment of War Gas Poisoning. P. J. Hanzlik, San Francisco.—p. 182.
Importance of Emergency Treatment of Compound Fractures. F. C. Bost, San Francisco.—p. 185.
Intratracheal Instillation of Liquid Petrolatum: Pulmonary Injury Therefrom. G. H. Houck, Los Angeles.—p. 187.
Cigaret Smoking: Its Effect on Volume and Acidity of Gastric Juice, with Particular Reference to Duodenal Ulcer. H. Rosenblum, San Francisco.—p. 191.
Physics: Its Application to Roentgen Therapy. R. E. Pugh Jr., Pasadena.—p. 194.
Human Rabies in California, with Discussion of Differential Microscopic Anatomic Diagnosis. J. C. Geiger and G. Y. Rusk, San Francisco.—p. 197.
Sulfanilamide: Its Use in Upper Genital Tract Infections in the Female. R. E. Gillett, San Francisco.—p. 206.
Id.: Its Use in Treatment of Gonorrhea of Lower Genital Tract of the Female. A. Manor, San Francisco.—p. 208.

Canadian Medical Association Journal, Montreal

39: 313-418 (Oct.) 1938

Sir William Osler, Bt., M.D., F.R.S.: I. The Last Phase (1905-1919): II. His Influence on Medicine as a Whole. H. Rolleston, Haslemere, Surrey, England.—p. 313.
Goiter from the Standpoint of the General Practitioner. E. M. Eberts, Montreal.—p. 324.
Two Unrecorded Cases of Quintuplet Births, Canadian and Italian. N. Ford, Toronto, and G. Caruso, Palermo, Italy.—p. 333.
Syphilitic Ulcerations with Histologic Picture of Prickle Carcinoma Cured by Antiluetic Treatment. A. Marin and A. Bernier, Montreal. —p. 336.
Head Injuries: Treatise Considering Accidents of the Day. W. O. Stevenson, Hamilton, Ont.—p. 338.
Leber's Hereditary Optic Neuritis Through Six Generations: A Sterilization Problem. W. C. Whiteside, Edmonton, Alta.—p. 347.
*Experimental Study of Toxicity of Various Types of Quartz. D. A. Irwin and C. S. Gibson, Toronto.—p. 349.
Diagnosis of Heart Conditions in Early Childhood. A. P. Hart, Toronto. —p. 352.
Slipping Rib. H. C. Ballon and L. Spector, Montreal.—p. 355.
*Magnesium Trisilicate in Treatment of Peptic Ulcer. C. J. Tidmarsh and R. G. Baxter, Montreal.—p. 358.
Syphilophobia and Allied Anxiety States. F. E. Cormia, Montreal.—p. 361.
Anemia in Infancy. N. B. Coward, Halifax, N. S.—p. 366.
Three Cases of Diabetes Insipidus, One Associated with Toxic Goiter. H. McPhedran, Toronto.—p. 370.
The Young Myope. F. A. Aylesworth, Toronto.—p. 374.
Secondary Postappendicectomy Abscesses. W. A. Shandro, Vegreville, Alta.—p. 375.

Toxicity of Various Types of Quartz.—Irwin and Gibson collected fourteen samples of quartz from underground working faces of mines in the Sudbury, Kirkland Lake and Porcupine districts. These samples included all the types of quartz commonly encountered in mining operations in these districts. Each sample was ground to a fine powder and injected subcutaneously in 10 mg. amounts into rabbits. The tissue response produced at the sites of injection was studied at intervals up to two years and all the samples gave rise to a nodular fibrosis that was essentially the same in extent and degree.

Magnesium Trisilicate and Peptic Ulcer.—Tidmarsh and Baxter used a brand of magnesium trisilicate, which conformed with the standard requirements of Mutch for true artificial sepiolite, in the treatment of thirty-six patients. Each drachm of the preparation contained 35 grains (2.25 Gm.) of the trisilicate, which is the generally accepted dosage. The number of doses was regulated according to the gastric acidity and the clinical progress. There were nineteen cases of duodenal ulcer, three of duodenal ulcer with massive hemorrhage, four of gastric ulcer and ten cases of functional indigestion (hyperacidity and the like). Approximately 89 per cent of the patients were completely free from symptoms or improved as a result of treatment. Of the three patients with ulcers who failed to respond to treatment, one, after two months' observation and treatment, was operated on and a large duodenal ulcer penetrating deeply into the pancreas was found; the other two were improved so far as gastric symptoms were concerned but were obliged to stop the trisilicate because of diarrhea, which persisted in spite of reduced dosage. The patient with functional indigestion who failed to benefit had been taking Sippy powders for years for relief of indigestion due to cardiac disease, and the trisilicate was given as an adjunct to other therapy. Six patients with ulcers who were nervous and showed marked pylorospasm and spastic colon were given a special formula con-

taining, in addition to the 35 grains of magnesium trisilicate, 1/500 grain (0.00013 Gm.) of atropine sulfate and one-eighth grain (0.008 Gm.) of phenobarbital to the drachm. These patients did not improve more rapidly than the others, but the mild antispasmodic sedative effects of the preparation brought about more restful nights, less apprehension and normal intestinal function.

Canadian Public Health Journal, Toronto

29: 425-476 (Sept.) 1938

Contribution of Radiology to Cancer Problem. G. E. Richards, Toronto.—p. 425.
Tuberculosis Mortality and Morbidity in the Counties of Lincoln and Welland, Ontario. C. G. Shaver, St. Catharines, Ont.—p. 434.
Results of Immunization of Nurses Against Scarlet Fever. R. A. H. Mackeen and Rheta Wilson, St. John, N. B.—p. 439.
Blood Groups in Poliomyelitis. I. H. Erb, H. S. Doyle and F. C. Heal, Toronto.—p. 441.
Communicable Diseases; Past, Present and Future. J. K. McLeod, Sydney, N. S.—p. 443.
Control of Communicable Disease: Federal Responsibility. J. J. Cameron, Antigonish, N. S.—p. 446.
Demonstration of Types of Bacillus Typhosus by Means of Preparations of Type II Vi Phage: I. Principles and Technic. J. Craigie and C. H. Yen, Toronto.—p. 448.

Florida Medical Association Journal, Jacksonville

25: 105-156 (Sept.) 1938

Preoperative and Postoperative Care of Intestinal Obstruction. H. A. Walker, Miami Beach.—p. 117.
Amebic Dysentery Carriers. M. J. Myres, Daytona Beach.—p. 122.
Hay Fever and Bronchial Asthma: Report of Cases. G. E. Henson, Jacksonville.—p. 125.
Florida Tuberculosis Control Program. J. A. Myers, Minneapolis.—p. 129.

Illinois Medical Journal, Chicago

74: 289-384 (Oct.) 1938

Intussusception. P. Rosenblum, Chicago.—p. 309.
Some Pharmacologic Considerations of Intestinal Obstruction. C. A. Dragstedt, Chicago.—p. 313.
(Ileus) Intestinal Obstruction. J. A. Green, Rockford.—p. 315.
Some Physiologic Principles Involved in Acute Intestinal Obstruction. L. R. Dragstedt, Chicago.—p. 320.
Value of X-Ray Study in Acute Bowel Obstruction. J. T. Case, Chicago.—p. 326.
Surgical Treatment of Acute Intestinal Obstruction. H. E. Ross, Danville.—p. 331.
Strabismus. W. A. Fisher, Chicago.—p. 335.
Gynecologic Radium Therapy. H. Swanberg, Quincy.—p. 344.
X-Ray Therapy of Uterus and Adnexa. E. P. Halley, Decatur.—p. 350.
Studies on Mercurial Diuresis: Esidrone, a New Mercurial Diuretic. I. F. Volini and R. O. Levitt, Chicago.—p. 355.
Nonmyxedematous Hypothyroidism: Case Reported with Psychosis. G. A. Wiltrakis, Elgin, and A. V. Partipilo, Chicago.—p. 359.
*Pathology of Pneumonia: Review of 150 Cases of Lobar Pneumonia in 3,585 Autopsies. J. D. Kirshbaum, Chicago.—p. 362.
Progress in Maternal Welfare. H. H. Hill, Chicago.—p. 364.
Study of Treatment of Epilepsy. R. G. Novick, Jacksonville.—p. 366.
Neglected, Forgotten But Some Extremely Valuable Remedies Used by the Laity for Treatment and Supposed Cure of Pulmonary Tuberculosis During the Seventeenth, Eighteenth and Nineteenth Centuries. J. Ritter, Miami, Fla.—p. 369.

Pathology of Pneumonia.—Kirshbaum reviews the pathologic changes observed in 150 cases of lobar pneumonia found in 3,585 consecutive necropsies. The incidence of lobar pneumonia as the primary cause of death was 4.18 per cent. Lobar pneumonia was rare in children, while the peak was reached between 41 and 50 years and remained high up to 60 years. The upper part of the right lobe was most frequently involved, being affected in seventy-five cases. The lower part of the left lobe was second, being affected in seventy-two cases. In 70 per cent of the entire series two or more lobes showed consolidation. The stage of engorgement or hyperemia was not observed in any of the cases. This stage is usually present only during the first twenty-four hours of the disease. The changes usually observed were gray hepatization, which usually appeared at the end of the fifth day of illness, and red hepatization when more than one lobe was involved. The stage of resolution, which is the stage of healing, was practically absent except in those cases in which death occurred from some complication of the pneumonic process. Fibrinous pleuritis was found in eighty-two cases, jaundice in twenty-seven, lung abscess in seventeen, pericarditis in twelve, endocarditis in eight, empyema in five and cystitis in three. Clinically too much emphasis seems to be placed on the extent of the pneumonic process in the lungs, minimizing the bacteriologic studies. It is not as important to know whether one or more lobes of the lung are involved as it is to know the causative organism present. The advances in the therapy of pneumonia depend to a great extent on definite bacteriologic studies. Bacteriologic studies were made in fifty of the 150 cases; sixteen showed pneumococci, streptococci of all types were present in fifteen, staphylococci of all kinds in seven, Friendländer's bacillus in five, Bacillus coli in four, B. influenzae in two, and Micrococcus tetragenus in one case. These bacteriologic studies show the high incidence of pneumonia due to organisms other than pneumococci, thus probably explaining the poor results obtained therapeutically in a large number of cases of pneumonia treated indiscriminately with pneumococcus serum.

Journal of Experimental Medicine, New York

68: 457-640 (Oct.) 1938

Carcinoma in Leopard Frog: Its Probable Causation by a Virus. B. Lucké, Philadelphia.—p. 457.
Chemo-Immunologic Studies on Conjugated Carbohydrate-Proteins: XII. Immunologic Properties of Artificial Antigen Containing Cellobiuronic Acid. W. F. Goebel, New York.—p. 469.
Renal Insufficiency Following Trypsin Injection into Renal Arteries. M. Friedman and L. N. Katz, Chicago.—p. 485.
Studies on Sensitization of Animals with Simple Chemical Compounds: V. Sensitization to Diazomethane and Mustard Oil. K. Landsteiner and A. A. Di Somma, New York.—p. 505.
Pyogenic Filtrable Agent in Albino Rat. W. H. Woglom and J. Warren, New York.—p. 513.
Carcinogenic Effect of Papilloma Virus on Tarred Skin of Rabbits: II. Major Factors Determining the Phenomenon: Manifold Effects of Tarring. J. G. Kidd and P. Rous, New York.—p. 529.
Cellular Reactions to Polysaccharides from Tubercle Bacilli and from Pneumococci. F. R. Sabin, A. L. Joyner and K. C. Smithburn, New York.—p. 563.
Ultracentrifugation Studies on Elementary Bodies of Vaccine Virus: I. General Methods and Determination of Particle Size. E. G. Pickels and J. E. Smadel, New York.—p. 583.
Id.: II. Influence of Sucrose, Glycerol and Urea Solutions on Physical Nature of Vaccine Virus. J. E. Smadel, E. G. Pickels and T. Shedlovsky, New York.—p. 607.
Lymphatic Pathway from Nose and Pharynx: Absorption of Dyes. J. M. Yoffey and C. K. Drinker, Boston.—p. 629.

Journal of General Physiology, New York

22: 1-130 (Sept.) 1938. Partial Index

Electrophoretic Mobility of Human Erythrocytes—Whole Cells, Ghosts and Fragments. W. H. Byler and H. M. Rozendaal, Schenectady, N. Y.—p. 1.
Intensity Discrimination in the Human Eye: II. Relation Between $\Delta I/I$ and Intensity for Different Parts of Spectrum. S. Hecht, J. C. Peskin and Marjorie Patt, New York.—p. 7.

Journal of Nervous and Mental Disease, New York

88: 397-568 (Oct.) 1938

Psychologic Considerations of Insulin Treatment in Schizophrenia. L. L. Orenstein and P. Schilder, New York.—p. 397.
Morbid Hunger in Relation to Narcolepsy and Epilepsy. M. Levin, Mayview, Pa.—p. 414.
Relationship of Polydipsia and Polyuria in Diabetes Insipidus: Study of Experimental Diabetes Insipidus in Dogs With and Without Esophageal Fistulas. R. T. Bellows and W. P. VanWagenen, Rochester, N. Y.—p. 417.
Present Day Research Trends in the Field of Human Deficiency. E. J. Humphreys, Thiells, N. Y.—p. 474.
Sounds in Language. T. K. Davis, New York.—p. 491.
*Treatment of Epilepsy with Synergistic Combination of Phenobarbital and Belladonna. A. E. Loscalzo, New York.—p. 500.

Treatment of Epilepsy with Phenobarbital and Belladonna.—Loscalzo compared the effect of phenobarbital plus a mixture of potassium bromide and chloral hydrate, and phenobarbital plus levorotatory belladonna alkaloids in thirty-two cases of epilepsy (idiopathic) of unknown etiology. The patients were under observation for one year or more. During the first twenty-six weeks the patients were given from one-fourth to one-half grain (0.016 to 0.032 Gm.) of phenobarbital three times a day and more than half of the group received in addition daily doses of a mixture of 7½ grains (0.5 Gm.) of potassium bromide and 7½ grains of chloral hydrate. The dosage of phenobarbital was arbitrarily established, although attempts were made to adjust the quantity to the requirement of the individual patient. The number of seizures experienced was 804. An almost universal complaint was that the medication produced a state of lethargy and at times somnolence. During the second period of twenty-six weeks, as a test of the observations of Friedberg, the thirty-two patients were given tablets containing three-fourths

grain (0.05 Gm.) of phenobarbital and 1/250 grain (0.00026 Gm.) of levorotatory belladonna alkaloids. The dosage was usually one-half tablet three times a day for those with less severe and less frequent seizures and four times a day for those of the moderately severe type and of more frequent occurrence, and one tablet three times a day for those whose condition necessitated the greatest degree of sedation. No other medication was employed. A total of 612 seizures occurred. There were no complaints of lethargy or somnolence except by the few patients who ingested the largest doses. About 40 per cent of these patients also stated that their convulsions now were much less severe. The patients were unaware of any change in medication aside from the fact that those who had previously taken both phenobarbital and the solution of bromide and chloral hydrate knew that the liquid had been discontinued. Consequently, any possible psychic effect was largely obviated. For the majority of patients the reduction in the number of seizures corresponded closely to the average result of slightly less than 24 per cent. Individual variations in response to the drug in a few cases, however, resulted in a decrease of from 50 to 60 per cent in the number of attacks, while in a limited number of less responsive patients a reduction of only from 5 to 10 per cent was noted. While there was a notable reduction in grand mal seizures, there was no alteration in the number of petit mal attacks. The results confirm the observations of Friedberg, Meggendorfer, Grinker, and Marchand and Viguier.

Kentucky Medical Journal, Bowling Green

36: 409-444 (Oct.) 1938

*Control of Hemorrhage, with Special Reference to Moccasin Snake Venom. G. S. Buttorff, Louisville.—p. 411.
Hazards of Blood Transfusion. E. Allen Jr., Louisville.—p. 414.
Telangiectatic Edematous Myxofibroma of Nasopharynx. G. F. Doyle, Winchester.—p. 421.
Acute Abdominal Emergency. I. Abell Jr., Louisville.—p. 423.
Angina Pectoris. F. H. Russell, Wickliffe.—p. 426.
Pentothal Sodium for Intravenous Anesthesia. Gladys Smithwick, Lexington.—p. 427.
Multiple Pregnancy. G. F. Brockman, Shepherdsville.—p. 429.
The Doctor Before the Jury. J. H. Hendren, Pineville.—p. 430.
The Physiology of Hunger and Thirst. H. Lawson, Louisville.—p. 432.
The Next Great Battle for Soldiers of Medicine. H. A. Luce, Detroit.—p. 435.
Classification and Diagnosis of Nephritis. J. R. Gott Jr., Louisville.—p. 439.
Hematuria in Shoe Dye Poisoning. C. Baron, Covington.—p. 441.

Control of Hemorrhage with Snake Venom.—Buttorff cites a case of cholelithiasis with empyema and biliary obstruction, relieved by operation but complicated by a biliary fistula, severe jaundice and intractable hemorrhages of undetermined etiology. Repeated transfusions of blood gave only temporary relief. All other measures used failed to check the bleeding, and the patient was moribund until moccasin snake venom was used. Three days after the first (0.4 cc.) subcutaneous injection 0.6 cc. of the venom was injected and there was no further bleeding. Two further injections (0.8 and 1 cc.) were given at intervals of three days.

Nebraska State Medical Journal, Lincoln

23: 361-400 (Oct.) 1938

Chronic Infectious Arthritis: Statistical Report of Findings and Treatment in Fifty Cases. M. J. Breuer, Lincoln.—p. 361.
Torsion of the Great Omentum: Report of Two Cases. C. Andrews, Lincoln.—p. 366.
Paranasal Sinus Disease in Children. S. Z. Faier, Omaha.—p. 370.
*Study of 836 Cases of Gallbladder Disease: Results of Medical and Surgical Treatment. J. D. Bisgard and R. G. Dornberger, Omaha.—p. 374.
Surgical and Hormone Treatment of Undescended Testicle. J. E. Courtney and J. W. Duncan, Omaha.—p. 381.
Treatment of Psychoses by Insulin and Metrazol. G. A. Young, Omaha.—p. 383.
Black Widow Spider Bite Treated with Calcium Intravenously: Case. C. T. Mason, Superior.—p. 389.

Gallbladder Disease.—Bisgard and Dornberger obtained data from the hospital records of 836 cases of extrahepatic biliary disease treated at the University Hospital from July 1925 to July 1936 and from the follow-up reports of the 434 patients who were traced. Of the 814 patients with benign lesions, 548 received operative treatment and 266 nonoperative dietary and medicinal therapy. In the surgical group there was a primary operative mortality of 5.4 per cent. Twenty-six patients were treated with cholecystotomy and follow-up reports were obtained from eleven of them. Five were well, four improved and two were unimproved and became well only after subsequent cholecystectomy. Two patients have remained well for more than ten years. Follow-up reports were obtained from 287 patients treated by means of cholecystectomy with and without choledochotomy. The results in those with gallbladders containing stones were very good and were considerably better than those in the group with stoneless gallbladders. In the former group 78 per cent considered themselves well and 96 per cent were well or improved as compared to 60 and 87 per cent in the latter group. However, 23 and 12.8 per cent had residual symptoms of dyspepsia, leaving only 55 and 47.2 per cent entirely asymptomatic. The highest percentage of cures occurred in the cases of cholesterosis with stones and the lowest in those with histologically normal gallbladders. Of the patients with normal gallbladders, 54 per cent were well and 77 per cent were well or improved. A comparison of the results of cholecystectomy in the same group of 287 cases, classified in respect to the symptoms of dyspepsia and colic, showed that the percentage of both cures and improvements were much higher in the colic than in the noncolic dyspeptic cases. This was true of all groups including cholesterosis and normal gallbladders. The difference, however, was much greater in the stoneless cases. Thus the degree and the likelihood of symptomatic relief by cholecystectomy is more dependent on the presence of stones or a history of colic than on the pathologic condition of the gallbladder. Reports from eighty-nine of the patients treated with nonoperative medical management show relief of symptoms in only 20 per cent and total asymptomatic relief in only 2 per cent. Nearly half of the entire group were unimproved. In both the surgical and the nonsurgical groups a large number of patients who considered themselves well continued to have some dyspepsia. Of the entire group of patients, 2.3 per cent were less than 20 years of age and 18 per cent were less than 30.

New York State Journal of Medicine, New York

38: 1257-1312 (Oct. 1) 1938

Mandelic Acid Therapy. M. F. Campbell, New York.—p. 1257.
Carcinoma of the Right Half of the Colon: Diagnosis and Treatment. C. F. Dixon, Rochester, Minn.—p. 1262.
Treatment of Diabetes: Use of Protamine and Crystalline Insulin. H. J. John, Cleveland.—p. 1266.
Acute Peribronchiectatic Pneumonitis: Preliminary Report. R. A. Bendove and M. D. Deren, New York.—p. 1273.
The More Serious Vascular Affections: Etiology and Diagnosis. J. Gutman, Brooklyn.—p. 1278.
A Modified Nasal Catheter for Use in Oxygen Therapy. D. W. Richards Jr., New York.—p. 1283.
Boric Acid Dermatitis. A. Rothberg and G. A. Merrill, Brooklyn.—p. 1284.
Acute Appendicitis with Jejunal Intussusception and Abdominal Lymphadenitis: Occurring in a Child Immobilized in a Spica Plaster Cast: Report of Case. A. Lesser and L. R. Kaufman, New York.—p. 1285.
Homologous Popliteal Cysts Occurring in Identical Twins. P. D. Allen and P. Manjos, New York.—p. 1287.

Ohio State Medical Journal, Columbus

34: 1085-1196 (Oct.) 1938

What Part Shall the Practicing Physician Take in the Campaign Against Syphilis? C. L. Cummer, Cleveland.—p. 1101.
Episiotomy: Technic of Repair. M. W. Diethelm, Toledo.—p. 1107.
Use and Abuses of Transfusion. W. D. Collier, Youngstown.—p. 1111.
Problems Associated with Reconstructive Procedures for Cleft Lip and Palate. J. O. Beavis, Dayton.—p. 1115.
Acute Poliomyelitis as Seen in a Recent Epidemic in Toledo, Ohio. H. G. Pamment, Toledo.—p. 1118.
Clinical Experiences with Insulin Therapy in Schizophrenia. R. F. Scherb and C. W. Stone, Cleveland.—p. 1120.
Nutritional Problems of the Preschool Child. R. A. Lyon, Cincinnati.—p. 1126.
Management of Obesity. E. P. McCullagh, Cleveland.—p. 1131.
Official Report of the Hospital Obstetrical Society of Ohio, for the Year 1937. B. Wylie, Lakewood.—p. 1136.
Activities of the Obstetrical Society of Dayton, Ohio. C. Sullivan, Dayton.—p. 1139.
Diabetes as an Obstetric Liability. T. P. Sharkey, Dayton.—p. 1141.

Rhode Island Medical Journal, Providence

21: 127-140 (Sept.) 1938

Ulcer of the Stomach and Duodenum: Cancer of the Stomach. R. H. Miller, Boston.—p. 127.
Chemistry and Mode of Action of Sulfanilamide and Related Compounds. E. G. E. Anderson, Providence.—p. 131.
Convulsive Disorders in Childhood: Answers to Common Questions. C. Bradley, East Providence.—p. 135.

Southern Surgeon, Atlanta, Ga.

7: 385-488 (Oct.) 1938

Some Experiences with the Flexible Gastroscope. J. L. Borland, Jacksonville, Fla.—p. 385.
Treatment of Malunited Fractures of the Ankle, with Special Reference to Fusion. W. C. Campbell, Memphis, Tenn.—p. 395.
Severe Hemorrhage of Peptic Ulcer Origin. J. R. Phillips, Houston, Texas.—p. 407.
Carcinoma of Upper Esophagus: Laryngectomy and Resection; Postoperative Mediastinitis with Drainage: Three Year Cure. M. Equen and F. Neuffer, Atlanta, Ga.—p. 411.
Osteomyelitis. I. Cohn, New Orleans.—p. 415.
Review of 100 Cases of Acute Ruptured Peptic Ulcer. J. C. Read, Atlanta, Ga.—p. 436.
Surgical Dyspepsias. A. L. Lockwood, Toronto.—p. 443.

Southwestern Medicine, El Paso, Texas

22: 345-390 (Sept.) 1938

Pulmonary Hypertension. T. J. Dry, Rochester, Minn.—p. 345.
Lesions of the Lips and Oral Cavity. L. M. Smith and R. P. Hughes, El Paso, Texas.—p. 349.
Congenital Umbilical Hernia: Report of Strangulated Case. W. J. Pangman, El Paso, Texas.—p. 351.
Intravenous Use of Fluids. H. C. Habein, Rochester, Minn.—p. 353.
Fractures of Spine with Injuries to the Cord. E. P. Palmer, Phoenix, Ariz.—p. 360.
Lead Absorption and Lead Poisoning. J. Rogde, El Paso, Texas.—p. 364.

Surgery, St. Louis

4: 483-648 (Oct.) 1938

Experimental Observations on Surgical Treatment of Hypertension. H. Goldblatt, Cleveland.—p. 483.
Some Aspects of Blood Pressure Regulation and Experimental Arterial Hypertension. C. Heymans, Ghent, Belgium.—p. 487.
Essential Hypertension: Selection of Cases and Results Obtained by Subdiaphragmatic Extensive Sympathectomy. W. M. Craig, Rochester, Minn.—p. 502.
Blood Potassium During Experimental Shock. R. L. Zwemer and J. Scudder, New York.—p. 510.
Studies of Sodium, Potassium and Chlorides of Blood Serum in Experimental Traumatic Shock, Shock of Induced Hyperpyrexia, High Intestinal Obstruction and Duodenal Fistulas. J. D. Bisgard, A. R. McIntyre and W. Osheroff, Omaha.—p. 528.
*Survival of Clostridium Sporogenes, Bacillus Subtilis and Staphylococcus Albus on Surgical (Catgut) Ligatures. Katherine E. Hite and G. M. Dack, Chicago.—p. 548.
*Treatment of Undescended Testis, with Special Reference to Therapy with Hormones. C. E. Rea, Minneapolis.—p. 552.
Primary Retroperitoneal Tumors: Report of Three Cases and 107 Cases from the Literature. R. T. Frank, New York.—p. 562.
Hypertrophy of Ligamentum Flavum: Report of Two Atypical Cases. J. M. Meredith and E. P. Lehman, University, Va.—p. 587.
Subcutaneous Injuries of Intestine and Mesentery. H. P. Totten, Los Angeles.—p. 597.

Survival of Bacteria on Ligatures.—Hite and Dack found that Bacillus subtilis when dried on surgical ligatures survives exposure to either toluene or alcohol for at least six months. Clostridium sporogenes survived in alcohol for six months but showed only slight resistance to the action of toluene. The experiments in general, however, indicate that any sporulating organism encountered in the routine sterility test might have been present on the ligature and should be considered as significant of possible contamination of the ligature, unless resampling indicates that they are sterile. Staphylococcus albus did not survive exposure to either toluene or alcohol for sufficiently long periods to be of significance to the contamination of ligatures, and on the basis of the experiments when encountered in the routine sterility test it indicates error in technic rather than contamination of the ligature.

Treatment of Undescended Testis.—Rea states that thirty patients with thirty-six undescended testes have been treated with antuitrin-S (Parke, Davis & Co.) at the University of Minnesota Hospitals. The ages of the patients varied from 4 to 24 years. The patients received 3,000 units of the preparation over a period of thirty days. Five patients with bilaterally retained testes responded to the treatment by degrees of descent of the testis into the scrotum. Descent was complete in three cases. It descended to only a high scrotal position in the other two cases. No untoward results have ever been observed over a period of two years following the use of antuitrin-S. There was suprapubic edema in three cases which disappeared after treatment and one patient complained of swelling in the left breast. In none of the cases was there a demonstrable increase in the size of the penis. The testes of the successfully treated cases often enlarged. There seemed to be no change in the size of the testes in the unsuccessfully treated cases. The scrotum of one boy became red and slightly edematous after 2,000 units of antuitrin-S had been administered. In none of the cases was there premature appearance or increase in the amount of pubic, axillary or facial hair. Five patients noticed increased frequency of erections. Two patients, aged 21 and 23 years, were treated by follutein (Squibb) for undescended testes. The testes were bilaterally retained (inguinal) in one case and inguinally arrested on the right side in the other. One cc. of follutein (125 units) was injected daily for ten days into the subcutaneous tissue of the thigh. No improvement was noted following this therapy; the patients were observed for a period of one year. Three patients, aged 2, 7 and 11 years, were treated with prephysin (Chappell). The undescended testes were unilateral and inguinally retained. Prephysin contains the follicle-stimulating principle of the pituitary gland, including small amounts of the luteinizing factor. Five-tenths cc. of prephysin (12.5 units) was injected daily for four days into the subcutaneous tissue of the thighs of these three boys. No descent of the testis was observed over a period of nine months. Four patients have been treated with gonadotropic substance. The special strength solution, 500 units per cubic centimeter, has been used in doses of 0.5 cc. every other day until fifteen injections have been given. In three patients with unilateral inguinal testes, observed less than five months, no beneficial results have been seen. However, in the fourth patient, a boy 9 years old, with bilateral inguinal testes, complete descent of both testes occurred after the ninth injection. The extremes of puberty being 9 (Scammon) and 18 years (Crampton), treatment of the congenitally retained gland may be deferred until the patient is from 9 to 11 years old. It is the practice at the University of Minnesota Hospitals to try gonadotropic substance in all uncomplicated cases of undescended testes before surgical procedures are instituted. If, after six months of observation, no results have been observed with endocrine therapy, surgical treatment of the undescended testis is advised if the patient is 9 years of age or older. Endocrine imbalance alone does not fully explain the cause or give a rational basis for treatment in all cases of true testicular maldescent.

Texas State Journal of Medicine, Fort Worth

34: 323-390 (Sept.) 1938

The Prevention of Heart Disease. J. Kopecky, San Antonio.—p. 331.
Modern Practical Methods in Treatment of Cardiac Decompensation. S. A. Shelburne, Dallas.—p. 335.
Nutritional versus Endocrine Factors in Bone Metabolism During Pregnancy. M. Bodansky, with assistance of Katherine Campbell and Virginia B. Duff, Galveston.—p. 339.
Result of Five Years' Experience with Desensitization for the Common Cold. L. A. Nelson, Dallas.—p. 343.
Fractures of the Skull: Study of 200 Cases. B. H. Bayer, Houston.—p. 346.
Certain Late Effects of Head Injuries. J. D. Gleckler, San Antonio.—p. 356.
Appendectomy Mortality: Brief Summary of 228,598 Cases. J. P. Barnes, Houston.—p. 360.
Relationship Between Allergy and Organic Pathology of Appendix. L. O. Dutton, El Paso.—p. 363.
Disease of Thyroid Gland and Its Pluriglandular Relationship. I. W. Jenkins, Waco.—p. 366.
Cancer Education. A. C. Scott, Temple.—p. 370.
Immunization Against Communicable Diseases: What, When and Why. J. G. Young, Dallas.—p. 372.

West Virginia Medical Journal, Charleston

34: 437-484 (Oct.) 1938

Human Blood as a Therapeutic Agent. C. B. Chapman, Welch.—p. 437.
Organized Medicine versus Quackery. A. B. Collins, Blacksville.—p. 452.
Head Injuries. W. P. Sammons, Wheeling.—p. 462.

Wisconsin Medical Journal, Madison

37: 873-972 (Oct.) 1938

Cholera Epidemics in Iowa County, Wisconsin. W. S. Middleton, Madison.—p. 894.
Complete Avulsion of the Scalp. W. F. Wilker, Iola.—p. 900.
Present Day Concepts in Diagnosis, Treatment and Prevention of Tuberculosis. J. A. Myers, Minneapolis.—p. 903.
Late Rupture of Extensor Pollicis Longus Tendon Following Colles' Fracture. W. P. Blount, Milwaukee.—p. 912.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

61: 237-338 (Sept.) 1938

Pick's Disease: Specific Type of Dementia. I. C. Nichols and W. C. Weigner.—p. 237.
Thalamus of the Chimpanzee: III. Metathalamus, Normal Structure and Cortical Connections. A. E. Walker and J. F. Fulton.—p. 250.
Tonic Foot Response to Stimulation of the Sole: Its Physiologic Significance and Diagnostic Value. K. Goldstein.—p. 269.
Note on Nucleus Ruber Magnocellularis and Its Efferent Pathway in Man. K. Stern.—p. 284.
Local Sweat Response to Faradic Stimulation. R. W. Wilkins, H. W. Newman and J. Doupe.—p. 290.
Dissemination of Glioma of Spinal Cord in Leptomeninges. K. C. Eden.—p. 298.
Fibrillation and Fasciculation in Voluntary Muscle. D. Denny-Brown and J. B. Pennybacker.—p. 311.

British Medical Journal, London

2: 645-690 (Sept. 24) 1938

Late Results of Partial Gastrectomy for Peptic Ulcer. J. Morley and F. H. Bentley.—p. 645.
*Prognosis of Anxiety States. A. Harris.—p. 649.
The Obstetric "Flying Squad." E. F. Murray.—p. 654.
Septal Deflection. W. S. Syme.—p. 656.
Calcium Mandelate and Sulfanilamide in Treatment of Urinary Infections. H. Droller.—p. 657.

Prognosis of Anxiety States.—Harris attempted to ascertain the present condition of 259 patients seen at the Maudsley Hospital during the years 1924, 1925 and 1926 in which the diagnoses were "anxiety neurosis," "anxiety state," "anxiety" "anxiety with depression" and "anxiety hysteria." Satisfactory follow-ups of 123 were obtained. Of these, thirty-eight were well, sixty were suffering from anxiety states, nine had developed psychoses and sixteen were dead. The main prognostic points elicited were that anxiety and its clinical manifestations may persist unchanged for ten years and over and that the percentage of cases in which it is converted to hypochondriasis is small. The prognosis is fairly good if the condition has lasted less than two years and, conversely, it is poor but not hopeless for ultimate and permanent recovery if the condition is of longer standing. The patient's chances of returning to work are always quite good, as only 20 per cent of those unable to work persisted in that state. If the patient's habits or mode of life remain substantially unchanged by the anxiety, the prognosis is good. The outlook for patients with markedly psychopathic personalities is poor. There was no evidence of increased susceptibility to organic disease.

Journal of Laryngology and Otology, London

53: 557-624 (Sept.) 1938

Pathology of Nasopharyngeal Tumors. D. F. Cappell.—p. 558.
Some Observations on Relation Between Tests by the Voice, Gramophone Audiometer and Pure-Tone Audiometer. J. A. Keen.—p. 581.

Lancet, London

2: 705-760 (Sept. 24) 1938

Radiography in Pneumonia: Diagnosis of Complications and Atypical Forms. F. G. Nicholas and C. D. Agassiz.—p. 705.
*The Rheumatic Lung. G. Hadfield.—p. 710.
Organic Gastric Syphilis: Review and Case Report. S. M. Laird.—p. 712.
Mitral Stenosis, with Chronic Passive Congestion Simulating Miliary Tuberculosis. A. F. W. Anglin.—p. 717.
*Action of Sulfanilamide on Leukocytes: Report on Fifty Ambulant Patients. C. J. C. Britton and J. Howkins.—p. 718.
Treatment of Urinary Infections in Puerperium. J. C. Cuthbert.—p. 720.
Technic for Spinal Anesthesia. O. S. Hillman.—p. 722.
Pneumocranium: Two Cases. J. H. Pringle.—p. 724.

The Rheumatic Lung.—Hadfield makes two criticisms of the published histologic accounts of the rheumatic lung. 1. There is no clear description of the sequence of changes in the lung nor any attempt to correlate microscopic changes with the probable or approximate duration of the disease as determined from clinical data. 2. A considerable amount of histologic research has been concerned with discovering lesions which resemble the Aschoff node as it is seen in other tissues or in finding changes in the pulmonary vessels of a specific kind such as those described by Pappenheimer and Glahn in 1924. The latter changes can be found in lungs in which rheumatic consolidation is absent and the Aschoff node as a clearcut lesion is difficult to identify in a loosely knit tissue like the lung, which in the intermediate stages of rheumatic consolidation is diffusely infiltrated by large mononuclear cells. The clinical features of rheumatic lung are as follows: The average age at death is 8.6 years. In 70 per cent of the patients death takes place during an acute exacerbation of a relapsing infection, the total average duration of which is one year. In 30 per cent the pulmonary consolidation complicates a first attack of virulent infection, the average duration of which is seven weeks. The final stage of acute dyspnea, which may be continuous or relapsing, varies from three to thirty days.

Action of Sulfanilamide on Leukocytes.—Britton and Howkins performed serial leukocyte counts of fifty ambulant patients receiving sulfanilamide in order to determine whether it produces any toxic leukocytic depression. After the usual routine clinical examination and a preliminary total blood count, the patient was given 0.5 Gm. of the drug three times a day for fourteen days, instructions being given to avoid saline purgatives and the foods containing sulfur. Serial total and differential leukocyte counts were made with ordinary standard pipets twice a week during the administration of the drug and for fourteen days subsequent to its cessation. All counts were carried out at the midfast period, between breakfast and lunch, to lessen the known daily fluctuations as much as possible. All precautions were taken to ensure the accuracy of the counts. The leukocyte count in thirty-two showed no marked variations —i. e., at no time was a leukopenia noted. In fourteen the count fell to between 5,000 and 4,000 per cubic millimeter of blood and in four to between 4,000 and 3,000. Of the total counts that fell below the threshold figure taken for leukopenia (5,000 per cubic millimeter) the lowest counts coincide with the end of the first week in two cases, the second week in three and the third week in nine. All four counts below 4,000 occurred in the third week. There was a tendency for the average total leukocyte count to fall steadily during the first week and to remain low for the next fortnight, rising to normal again by the end of the third week. The standard deviation of the counts observed on the different days of treatment was practically constant, being approximately ± 1,500. In twenty-three patients the polymorphonuclear count at some time fell below 3,000; in twelve the figure fell below 2,500 and in five below 2,000. Invariably the lowest figure was found at the end of the second or beginning of the third week. The lymphocytes showed little or no change. In twenty-two cases the monocyte count rose above the upper normal level of 500 per cubic millimeter and in nine above 750. These changes were most common during the second and third weeks. An eosinophilia of more than 400 was observed in seven cases and in three it exceeded 500. Usually a rash accompanied this eosinophilia, but a moderately severe rash was at times unaccompanied by eosinophilia and vice versa. Thirty-five patients complained of toxic symptoms such as headache, dizziness, vertigo, depression, listlessness, somnolence and nausea, and tinglings in the hands and feet occurred. There was no definite relationship between such symptoms and any blood change. Two patients had marked dizziness accompanied by such a feeling of disorientation that they refused to walk in the streets alone. Such toxic symptoms were present most often in the first week and rarely in the second. Cyanosis occurred in nine cases but there was no relation to any blood change. Rashes were present in thirteen, in one of which cyanosis occurred. The rash was commonly urticarial in type and irritable. Both the rash and the cyanosis may disappear spontaneously even if the drug is continued.

Medical Journal of Australia, Sydney

2: 447-490 (Sept. 17) 1938

Cellular Response to Injury. C. H. Kellaway.—p. 447.
Medicolegal Risks in Medical Practice. D. M. Morton.—p. 452.
Critical Survey of Renal Function Tests in Their Application to Determination of Renal Efficiency in Toxemias of Pregnancy. Vera I. Krieger.—p. 457.
Temperature as Factor to Be Considered in Clinical Urinometry. L. A. Windsor-McLean.—p. 467.

Presse Médicale, Paris

46: 1417-1432 (Sept. 24) 1938

*Extracutaneous Localizations of Myxedema. G. Maranon.—p. 1417.
Malaria: Parasitic Reticulo-Endotheliosis. G. Sicault and A. Messerlin. —p. 1419.

Extracutaneous Localizations of Myxedema.—Maranon shows that myxedema, the typical lesion of thyroid insufficiency, not only involves the integument but attacks other parts of the organism as well, although with less frequency than the subcutaneous tissue. Myxedema is regarded as an infiltration of the tissues with mucin, a substance the formation of which is regulated by the thyroid hormones. Two factors are essential for correct diagnosis: 1. The supposed extracutaneous localization must coincide with other myxedematous manifestations. 2. The symptoms must disappear with the same promptness in response to thyroid therapy as do the cutaneous myxedematous lesions. The first type of extracutaneous localization of myxedema mentioned by the author is that which is localized in the nasal and pharyngeal mucosa. It produces dryness of the mucosa and difficulties in nasal respiration. Typical signs of this localization are the necessity of sleeping with the mouth open and sonorous snoring. If myxedematous infiltration exists in the buccal and lingual mucosa, it may produce dryness of the mouth. Another symptom is the hypertrophic and cracked appearance of the tongue and the loss of the sense of taste. The latter explains the lack of appetite in patients with hypothyroidism. Another symptom which may accompany the buccal and lingual localization of myxedema is a bad odor from the mouth. The author says that patients with hyperthyroidism often present deafness, buzzing in the ears and perhaps vertigo. Laryngeal localization, that is, infiltration of the mucosa of the vocal cords and of the larynx, probably explains to a great extent the faint tonality of the voice of patients with hypothyroidism. Many of the digestive disturbances presented by patients with myxedema, which have been attributed to secondary changes of the neurosympathetic system, in reality are due to direct visceral localization of the myxedema. He discusses the effects of myxedematous infiltration of the salivary glands, of the esophagus, of the gastric mucosa, of the anal mucosa and so on. He points out that in young persons the large myxedematous heart becomes entirely normal again following treatment with thyroid. He thinks that infiltration of the mucosa of the genitalia is quite frequent in women with hypothyroidism and thinks that this explains at least partly the frigidity of these patients. Finally he discusses infiltration of the nervous and of the locomotor system. Regarding the latter he says that in his material he found no definite proof of arthropathies of hypothyroid origin.

46: 1433-1448 (Sept. 28) 1938

Vitamin B_1 in Treatment of Algesias. F. Coste and J. Metzger.—p. 1433.
*Treatment of Pulmonary Asthma by Ascorbic Acid (Vitamin C). D. Hagiesco, G. Bazavan, M. Criscota and M. Cioranesco.—p. 1435.
Return to Work and Social Future of Patients with Pulmonary Tuberculosis. A. Fabre.—p. 1438.

Treatment of Pulmonary Asthma with Vitamin C.—Hagiesco and his associates think that the unreliability of the results obtained heretofore in the treatment of pulmonary asthma justifies trials with new measures. Numerous investigations on vitamin C disclosed a number of pharmacodynamic actions which warrant its employment in disorders that have nothing in common with C-avitaminosis or C-hypovitaminosis. For instance, it has been proved that vitamin C is a powerful catalyzer, that it stimulates the activity of different ferments, that it contributes to the maintenance of the functional activity of the bone marrow and of the capillaries, that it possesses antitoxic and anti-infectious properties, that it influences the sympathetic nervous system, that it has a diuretic effect, that it influences the tonus of the heart and vessels and that it has a strong antianaphylactic action. Relative to the latter property the authors point out that in various pathologic disorders which are due to allergy it has been demonstrated that ascorbic acid diminishes the hyperergic manifestations as well as the modifications in the equilibrium of the blood proteins which are characteristic for these hyperergic conditions. They cite reports from the literature on the antianaphylactic action of vitamin C and on its use in the treatment of asthma and then state that they used vitamin C in twenty cases of asthma, most of which were obstinate. In fifteen of these cases the results were good or favorable, while in the other five cases they were doubtful or negative. The authors give several case histories and then analyze the results. They take up separately the action on the individual attack, on a series of attacks and during a period of intermission. Regarding the action on the individual attack, they say that the injection of vitamin C has a suspensive action but that the return to a normal respiration is slow (from fifteen to thirty minutes) and even then may be incomplete. The intravenous injection is the only really effective mode of administration during the attack and the doses must be comparatively high. At the first injection from 200 to 300 mg. should be administered. If no improvement is observable after fifteen minutes, another dose of from 100 to 200 mg. may be given. About the effect of vitamin C on a series of attacks, the authors say that in the cases which react well to the vitamin C therapy the attacks cease entirely after from one to five injections and that the attacks always become less severe and prolonged. During the period of cessation the injections are continued intermittently. Patients with certain prodromal symptoms should have an injection every time that it seems necessary. It is advisable to give other patients at least five or six injections every month of 100 mg. each. The mode of administration is intravenous. The intramuscular injections are reserved for the periods of intermission and for the cases in which intravenous injection is impossible. The authors found that the oral administration of vitamin C has no antiasthmatic effect.

Sang, Paris

12: 801-912 (No. 8) 1938

Agranulocytic Syndrome with Myeloblastoma and Reticulo-Endothelial Proliferation in Marrow, Viscera and Eyes. R. Waitz and G. Hoerner. —p. 801.
*Modifications of Blood Conserved for Several Weeks and Its Therapeutic Effect. H. Gnoinski.—p. 820.
Several Biologic Investigations on Catalase in Blood. H. Werner.—p. 832.

Modifications of Conserved Blood.—Gnoinski's investigations were aimed at determining under what conditions preserved blood is kept from undergoing hemolysis, what factors prolong the period of conservation, what changes take place in the blood during its conservation and finally how long blood can be conserved outside the organism and still be suitable for transfusion. His studies were made on the blood of forty dogs and on that of eighteen human subjects. The blood was examined before withdrawal, after the addition of sodium citrate, three hours later and finally at intervals of one, two, three and five days. It was found that the blood which is withdrawn in an aseptic manner and which at the time of withdrawal is mixed in the proportion of 1:5 with a 6 per cent solution of sodium citrate can be employed for more than eighty days if the following precautions are adhered to: 1. The blood must be kept in a hermetically closed container. 2. The blood must completely fill the container. 3. The container with the blood must not be subjected to shocks. 4. The blood must be kept in the refrigerator at a temperature of from 4 to 5 C. Studies on the erythrocytes revealed that some of the erythrocytes (about 15 per cent) are destroyed; others (about 40 per cent) undergo morphologic changes, and the remainder stay unchanged. The leukocytes were found to undergo considerable modifications in a rather short time. The blood which is conserved for more than sixty days is not toxic and it can be employed for transfusion without provoking disturbances. The author demonstrated this on six women. One of them was given a transfusion with blood that had been preserved for seventy-five days, another one with blood preserved for eighty-five days and the others with blood preserved for from sixty-four to sixty-six days. These transfusions demonstrated not only the harmlessness but also the great therapeutic value of conserved blood. It stimulates the hematopoietic system, which is proved by the increase in the number of erythrocytes. Encouraged by the results obtained so far, the authors plan to continue the clinical use of conserved blood.

Bullettino delle Scienze Mediche, Bologna

110: 141-208 (May-June) 1938. Partial Index

Echinococcus of Liver and Spleen: Iconographic Study. G. Giordano and M. Boccioni-Giordano.—p. 150.
Importance of Functional Stimulation in Formation of Articular Cavity. C. Casuccio.—p. 168.
Surgery in Trigeminal Neuralgia. F. d'Ajutolo.—p. 182.
*Epidemiologic Importance of Carriers of Diphtheria Bacilli. A. Rosa and A. Chieco.—p. 190.

Epidemiologic Importance of Carriers of Diphtheria Bacilli.—Rosa and Chieco made investigations on identification of diphtheria bacilli in a group of children who were living in Bologna in a government home for children of tuberculous families. The Schick test performed on 120 children gave positive results in forty-eight cases and negative results in seventy-two cases. One week later one of the children became ill with diphtheria and was transferred to the hospital. After this event seroprophylaxis was carried out in all children. Search for diphtheria bacilli showed the presence of forty-nine carriers in the group. Both the mild and intermediate types were identified. In eight cases diphtheria bacilli of both the mild and intermediate types coexisted. Forty-eight strains of the bacilli which were identified in the carriers killed guinea pigs. Forty-six strains killed the animals within three days and two strains killed them within six days. The author emphasizes the epidemiologic importance of carriers.

Clinica Ostetrica, Rome

40: 437-492 (Sept.) 1938

*Pulmonary Tuberculosis and Menstrual Disturbances. L. Praloran.—p. 437.
Spontaneous Delivery of Fetus in Shoulder Presentation: Case. G. Betto.—p. 444.
Pathogenic Mechanism of Tuberculous Salpingitis by Peritoneo-Adnexal Diffusion. A. Fortunato.—p. 451.
Utility of Intraparenchymal Uteral Injections of Posthypophysial Extract in Comparison with Uterovaginal Packing. E. Giudici.—p. 468.

Pulmonary Tuberculosis and Menstruation.—Praloran studied the relations between pulmonary tuberculosis and menstrual disturbances in a group of 620 women. Those who had menstrual disorders before the development of pulmonary tuberculosis, as well as those who were suffering from gynecologic diseases, were excluded from the group. The author concludes that women with pulmonary tuberculosis and menstrual disturbances may have benign tuberculosis of the genitalia, which is the cause of the menstrual disturbances. Frequently, however, the irregularities of menstruation, especially amenorrhea, oligomenorrhea, hypermenorrhea and metrorrhagia, depend on the intensity of tuberculous toxemia and subside as the lesions of pulmonary tuberculosis improve with the administration of a proper treatment. In menstrual disturbances, either grave or of long duration, it is advisable to resort to treatment for pulmonary tuberculosis. Menstrual (especially premenstrual) increase of the temperature is frequent in 20 per cent of the cases in pulmonary tuberculosis and the appearance of menstrual hemoptysis is frequent in 3 per cent of the cases. The general (sensory, gastric, cardiac and circulatory) phenomena follow a normal behavior in the course of pulmonary tuberculosis.

Minerva Medica, Turin

2: 245-268 (Sept. 15) 1938

Behavior of Polypeptides, Sugar and Urea in Blood in Diabetes After Administration of Peptone Before and After Insulin Treatment. R. Locascio.—p. 245.
Early Roentgen Diagnosis of Gastric Cancer. F. Gagna.—p. 247.
*Intravenous Pyelography and Chromoscopy for Renal Functions. S. Biancardi.—p. 254.

Tests for Renal Function.—Biancardi states that chromoscopy by indigo carmine is a more sensitive test than descending pyelography for the measurement of renal function. The author carried on a comparative study of the elimination, in the same patient, of indigo carmine and the opaque substance which was intravenously administered for descending pyelography. The observations were made in a group of 150 cases which included pyelonephritis, renal ptosis, hydronephrosis from either renal ptosis or ureteral or pelvic calculi, calculous and other forms of pyonephrosis and hydropyonephrosis, renal tuberculosis, renal tumors, hematuria, renal ectopia, contusion, cystitis and some other renal diseases. He found that grave alterations of the renal parenchyma are shown by disturbances of the same intensity in the elimination of the indigo carmine and of the opaque substance. When the parenchyma is slightly involved the elimination of the pyelographic substance is normal, whereas indigo carmine is either insufficiently eliminated or not eliminated at all.

Archiv für klinische Chirurgie, Berlin

192: 545-686 (Sept. 6) 1938. Partial Index

Delayed Emptying of Ileum and Stasis in Chronic Appendicitis. S. Teneff.—p. 545.
*Significance of Relationship of Openings of Biliary and Pancreatic Ducts to Each Other in Causation of Gallstones. H. Mehnen.—p. 559.
Internal Biliary Fistulas Developing on Basis of Ulcer. F. Köberle.—p. 572.
Effect of Denervation of Hepatic Hilus and Renal Hilus on Abscess Formation in Liver and Kidney. U. Kawabata.—p. 595.
*Gastric Acidity After Operations for Gastric Duodenal Ulcer with Particular Attention to Relation Between Operative Result and Postoperative Gastric Secretion. M. Tomoda and J. Aramaki.—p. 604.
Echinococcus of Ovary and Omentum in Woman Operated on Six Years Previously for Gastric Cancer. Mátyás Mátyás.—p. 631.

Openings of Biliary and Pancreatic Duct and Causation of Gallstones.—Mehnen describes four different types of the opening of the common bile duct and the pancreatic duct into the intestine. He had investigated 449 cases and found a separate opening into an individual papilla in nineteen, a separate opening into a common papilla in 151 cases and a common opening with formation of a diverticulum in 248 cases, while in twenty-seven cases the pancreatic duct and the choledochus entered the duodenum about 8 mm. away from the papilla of Vater without formation of a diverticulum. Thus the anatomic relationships found made it possible in 61.25 per cent of the cases for regurgitation of pancreatic juice into the gallbladder in the cases of obstruction in the opening of the ducts into the intestine. The author had established that among the 275 cases presenting the possibility of regurgitation of pancreatic secretion there were 35.3 per cent instances of gallstones, while in 174 cases with separate openings the stones were found in only 14.4 per cent. The incidence of cholesterol-pigment-calcium stones in joint opening of the ducts as opposed to that of cases in which there was no possibility for back flow was as 4:1 and the incidence for pure cholesterol stones as 7:1, while for pure pigment stones it was as 1:5. The author investigated 200 cases with regard to the gallbladder content. The characteristic sediment in cases of joint opening of the large ducts consisted of cholesterol crystals, while that for the separate openings were bilirubin concrement. The author interpreted these observations by assuming that the regurgitation of the pancreatic juice into the gallbladder leads to diminution of biliary acids and therefore to precipitation of cholesterol, which in turn favors the formation of cholesterol-pigment-calcium stones and particularly the formation of pure cholesterol stones. The fact that of the twenty-nine cases of strawberry gallbladder twenty-five presented the possibility of regurgitation of pancreatic juice supports the concept of the disturbance of the solubility of cholesterol through the regurgitation of pancreatic secretion.

Gastric Acidity After Operations.—Tomoda and Aramaki report a study of gastric secretion before and after operation in 135 cases of gastric-duodenal disease carried out for periods of from several weeks to thirteen years after operation. The figures obtained for the acidity in thirty-two cases of gastro-enterostomy were not uniform. This operation has failed to lower the acid values. In the majority of the cases the authors found either normal or excessive values. The anacidity occurred very seldom after a gastro-enterostomy. They found in twenty-nine cases of resection for exclusion that the free hydrochloric acid was absent or markedly lowered independently of whether one practiced mucoclasis of the mucosa of the antrum or not. The free hydrochloric acid was either absent or markedly lowered in seventy cases following stomach resection. The authors found that the success or failure of an operative procedure on the stomach did not have a clear relation either to the lowering or to the increasing of the acid values. The consideration of the acid values alone in a stomach that has been operated on has no value in determination of the success or failure of a given operation. Equally unreliable is the assumption that the complaint of heartburn or gastric pain is characteristic of hyperacidity. A number of surgeons, and of late

particularly Max Friedemann, insist, however, that a diminution or increase of free acid after operation is essential to good results. This, however, is a purely empirical and not a scientifically proved assertion. Conclusions as to the secretion of the stomach stump based alone on the consideration of the acid values in aspirated stomach contents are unreliable. The observations of the Portises, of Enderlen and Zukschwerdt and of Shapiro support this view. From their studies it is evident that the first phase of secretion presents no qualitative alteration and that the second phase is compensated by the intestine. Shapiro's observations that even the subtotal gastric resection does not result in lasting lowering of the hydrochloric acid secretion and cannot therefore prevent the development of new ulcers deserve particular attention. It has been established recently that extensive gastric resection gives the best results. However, there is no scientific explanation for the failure or success of this operation. The authors feel that their investigation contradicts the widely accepted but definitely empirical explanation for the success or failure of the wide resection.

*Deutsche medizinische Wochenschrift, Leipzig

64: 1277-1312 (Sept. 2) 1938. Partial Index

Significance of Anamnesis for Diagnosis of Cerebral Tumors. P. Vogel. —p. 1277.
Nursing at the Breast and Prophylaxis and Therapy of Mastitis. R. K. Kepp.—p. 1281.
*Treatment of Hemophilia with Female Sex Hormone. A. Kocsis and A. Hasskó.—p. 1284.

Treatment of Hemophilia with Female Sex Hormone.—Kocsis and Hasskó point out that since women do not show the symptoms of hemophilia although they transmit it to their offspring, it has been concluded that the sex apparatus and the endocrine system of women prevent the manifestation of the disease. Consequently attempts were made to counteract hemophilia by means of female sex hormones. They describe case histories and then take up the dosage, pointing out that during a hemophilic hemorrhage from 500 to 1,000 mouse units of female sex hormones must be administered daily. They maintain that the best results are obtained by the intravenous injection of a preparation that contains all the hormones of the ovaries, but that the subcutaneous injection into the extensor surface of the thigh is the more simple method. During severe hemorrhages, 500 mouse units may be administered by intramuscular injection twice daily and the action of this treatment can be supported by corpus luteum tablets. The capacity of the ovarian hormone to arrest hemorrhage and promote coagulation was proved also when it was administered locally, for instance in tooth extractions. In vitro tests corroborated the coagulating effect of ovarian hormone extract on hemophilic blood.

Monatsschrift für Kinderheilkunde, Berlin

75: 1-176 (Sept. 9) 1938. Partial Index

Convulsions During Childhood: Pathologic Anatomic Studies. W. Scholz.—p. 5.
Modification of Convulsions During Early Childhood by Means of Roentgen Irradiation. E. Wittermann.—p. 44.
After Examinations on Children With and Without Intracranial Hemorrhages Sustained During Birth. S. Liebe.—p. 47.
Recurring Intestinal Diseases During Childhood. K. Hassmann.—p. 67.
Clinico-Experimental Investigations on Respiration in Fresh Air Treatment of Pneumonia. J. Jochims.—p. 73.
*Demonstration of Viruses in Rubella, Epidemic Parotitis and Aphthous Stomatitis. H. Steinmaurer.—p. 98.
Experiences with Prophylaxis of Measles by Means of Placental Extract. H. G. Huber and M. Kurz.—p. 106.
Prophylaxis of Rickets in Premature Infants by Means of Single Large Dose of Vitamin D. Windorfer.—p. 124.

Viruses in Rubella, Mumps and Aphthous Stomatitis.—Steinmaurer reports that he demonstrated viruses in three children's diseases in which this had not been done before. His work was greatly facilitated by fluorescence microscopy, the latest improvement in this sphere. In twenty children with rubella he examined specimens of the nasal and pharyngeal secretions and of the blood beginning with the day of the appearance of the eruption. Moreover, cantharis blisters were produced in the majority of these children. Specimens were examined daily from the children who had been exposed, beginning from the first day of incubation. The examinations were continued even after the disappearance of the exanthem. On the day of the exanthem the author detected large quantities of extremely small but well differentiated forms of a virus in the nasal and pharyngeal specimens in all cases. The virus was demonstrated also in the blood. Here the virus bodies were partly free and partly phagocytized by leukocytes. The virus was obtained in pure form from the lymph of the cantharis blisters. The author says that he examined all specimens under the fluorescence microscope as well as after staining with victoria blue and some also after staining according to Morsow's method. Identical results were obtained, except that the stained specimens were sometimes diluted and consequently less clear than the primulin preparations. The author considers it as especially noteworthy that the nasopharyngeal specimens were almost free from the usual bacterial flora at the time when the virus was present in large quantities, whereas the ordinary bacterial flora was present when, during the earlier or later stages, the virus was present in smaller quantities. The serial examinations revealed that the quantity of virus increased greatly one or two days before the appearance of the exanthem and reached the peak on the day of the eruption of the exanthem; it completely disappeared two or three days afterward. The author regards these always recurring fluctuations as a proof for the etiologic significance of the demonstrated virus. He mentions also that it proved possible to cultivate the virus on the chorioallantois of the incubated hen's egg, which proves that the detected granules are of the nature of a virus and not merely a lifeless substance. In studies on the saliva of eighteen children with mumps, he demonstrated a virus which is considerably larger than that of German measles. This virus likewise could be cultured in egg medium. Finally, the author demonstrated virus bodies in specimens obtained from the aphthae of nine patients with aphthous stomatitis.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 4151-4294 (Aug. 27) 1938. Partial Index

Foundations of Treatment of Exophthalmic Goiter. H. Feriz.—p. 4157.
*Occurrence of Abnormally Large Quantities of Testis Hormone in Urine of Patients with Adrenal Tumor. E. Dingemanse and E. Laqueur. —p. 4166.
Typhoid in Volendam. H. Peeters and A. Charlotte Ruys.—p. 4171.
*Zinc as Cause of Food Poisoning. C. G. J. Dornickx.—p. 4185.

Testis Hormone in Patients with Adrenal Tumor.—Dingemanse and Laqueur say that the clinical picture of virilism in women suggests that an increased production of testis hormone (comb growth promoting substance) might be a causal factor in this condition. In several cases of hirsutism without adrenal tumor they were able to detect a moderate increase in the testis hormone content of the urine. Whereas the normal testis hormone content of the urine varies between 40 and 50 international units per liter, in women with hirsutism it was found to be between 75 and 150 international units. In three patients with adrenal tumor the testis hormone content of the urine varied between 600 and 2,200 international units and the diagnosis of tumor of the adrenals was corroborated by pathologic-anatomic observations. The authors cite three other cases of hirsutism in which an adrenal tumor was suspected. The results of the determination of testis hormone in the urine of these patients did not justify the diagnosis of tumor of the adrenals. The authors admit that their material is as yet too small to warrant generalizing conclusions. Nevertheless, they regard the large quantities of comb growth promoting substance excreted by the three patients with hypernephroma as worthy of attention. In the other patients with hirsutism of different, mostly unknown, origin the testis hormone content was only moderately increased. It is suggested that a simultaneous increase in the estrogenic substances may prove to be of diagnostic value.

Zinc as Cause of Food Poisoning.—Dornickx reports that more or less severe symptoms of poisoning developed in twenty-five of forty-two men who had eaten of the same food at a table for junior officers. Bacteriologic tests proved negative, but chemical tests revealed 83 mg. of zinc in 100 Gm. of cooked apples and 17 mg. of zinc in 100 Gm. of vomit. Inquiries disclosed that the dried cooked apples which had been served at the meal had been cooked in a kettle of galvanized iron, from which they absorbed considerable quantities of zinc. The author reviews the literature on zinc poisoning and reaches the conclusion that cooking utensils should not be made of galvanized iron.

Acta Medica Scandinavica, Stockholm

96: 105-426 (Sept. 3) 1938. Partial Index

New Therapeutic Method of Trigeminal Neuralgia. O. Ried.—p. 105.
*Clotting Power of Human and Mammalian Blood in Relation to Vitamin K. H. Dam and J. Glavind.—p. 108.
Monocytic Leukemia. O. K. Evensen and H. Schartum-Hansen.—p. 129.
Quantitative Demonstration of Urobilinogen in Blood Plasma. C. J. Roos.—p. 140.
Clinical and Experimental Observations on Alcohol Tolerance. J. Erwteman and P. A. Heeres.—p. 198.
*Sympathico-Endocrine Insufficiency. H. Engelkes.—p. 231.
Pathogenesis of Anemia Produced by Bothriocephalus Latus. G. Tötterman.—p. 268.
*Rheumatic Fever and Nephritis. H. A. Salvesen.—p. 304.

Clotting Power of Blood in Relation to Vitamin K.—Dam and Glavind direct attention to the fact that a method for the determination of the clotting power of avian blood on addition of tissue extract from the same or related species was described by Albert Fischer in 1930. This method is utilized in the assay of vitamin K. The authors adapted this method for human and mammalian blood in which the thrombocytes normally play an important part in the clotting process. To prevent clotting before the determination can be made, heparin is added to the blood. The coagulation deficiency is expressed by the quotient $R = \frac{K}{K_n}$, K representing the concentration of the tissue extract which under fixed conditions produces clotting of the plasma in three minutes, while K_n represents the corresponding concentration for a normal plasma. The authors show further that it is possible to develop in rabbits a mild degree of K avitaminosis by means of a K-free diet. Then they describe how they used the aforementioned method for the determination of the clotting power of the blood of patients with various diseases. In essential thrombopenia and hemophilia the blood plasma was found to have normal R values when tested by this method, which does not register cellular anomalies. In obstructive jaundice a reduction of the clotting power could be demonstrated. In some of these cases the R values were considerably increased. The coagulation deficiency in obstructive jaundice was investigated with respect to its relation to the dietary K avitaminosis in chicks. The R values of mixtures of plasma in cases of obstructive jaundice and of normal plasma had great resemblance to those of mixtures of plasma from chickens with K avitaminosis and of plasma from normal chickens as well as of mixtures of plasma that was free from prothrombin and of normal chicken plasma. Obstructive jaundice was produced in normally fed chickens by ligation of the choledochus. Rapid increase of the R values occurred about twenty-four days after the occlusion of the choledochus. It was possible to restore the clotting power to normal values (reduce the R value to about 1) by one single intracardial injection of a K vitamin concentrate. In five cases of obstructive jaundice in patients with rather high R values the clotting power was rendered normal by from three to five intramuscular injections of emulsions of vitamin K. Discussing the etiology of the clotting deficiency in obstructive jaundice, the authors point out that vitamin K and other fat soluble substances are poorly absorbed when bile is absent.

Sympathico-Endocrine Insufficiency.—Under the term of sympathico-endocrine insufficiency Engelkes describes a syndrome of which he could find no description in the literature. He reports the clinical histories of two cases. The first one concerned a man, aged 41, who became acutely ill in October 1932. On waking up one morning he found his face, hands and feet swollen. This was accompanied by numbness of the extremities. Soon after this an intense cyanosis developed all over the body, which was maximal on the peripheral parts: hands, feet, ears and nose. This cyanosis was not accompanied by dyspnea. The possibility of a poisoning was considered. On spectroscopic examination of the blood, however, no changes of the hemoglobin were found. Extensive cardiologic examination revealed no changes of the heart. A marked enlargement of the liver and spleen was found, but there was no ascites. During the subsequent months edema developed and an increasing disturbance of the gait, owing to a polyneuritis. The patient became progressively emaciated. During the months from January to June a gradual decline occurred in his condition; his legs became paretic, his arms in a less degree. Sensitivity was impaired below the knees, the disturbance increasing toward the periphery. The cyanosis of the skin gradually gave way to pigmentation. Two months later he complained of severe pain in the lower extremities, excessive tiredness, and at times dull epigastric pain. His appetite was fair. Often he was drowsy and could sleep for days at a stretch. Emaciation was excessive. The skin showed a pigmentation completely corresponding in color and distribution with that found in Addison's disease. The legs were edematous and of a livid color and were kept in an equinus position. The four smaller toes of the right foot on their dorsal aspect showed gangrenous ulcers. On treatment it soon became clear that digitalis and diuretics did not influence the edema. A diet rich in vitamin C and the vitamins of the B group was given. When no more improvement was obtained with these, adrenal cortex extract was added. Soon, however, bronchopneumonia developed to which the patient succumbed after an illness of twenty-three months. The clinical picture presented by the second patient, apart from minor details (absence of pigmentation and increased basal metabolism), completely corresponded to that of the first case; that is, the disorder began with a rather acute stage, with acrocyanosis and congestion of the abdominal organs. This was followed by a more chronic stage in which these signs gradually decreased and a severe polyneuritis developed, with edema, trophic ulcers and endocrine disturbances, especially of an adrenal nature. In the second case a necropsy was performed but nothing was found which would explain the severe disorder. Slight changes were detected only in the subthalamus. The author thinks that the symptoms can be explained as a disturbance in the sympathetic innervation, most probably resulting from a primary lesion of the sympathetic basal ganglions in the midbrain. He suggests that the term sympathico-endocrine insufficiency best characterizes the disorder.

Rheumatic Fever and Nephritis.—Salvesen draws attention to rheumatic nephritis, a form of nephritis which develops during or shortly after an attack of rheumatic fever or, in rare cases, immediately preceding it. He reviews the clinical histories of six cases classified as rheumatic nephritis. Only the first of these cases, which is given in detail, differs somewhat in its clinical aspects from cases of acute glomerular nephritis. It started as an ordinary post-tonsillitic rheumatic fever, but after a few days azotemic uremia with almost complete anuria developed and at the same time all the signs of rheumatic fever, including the increased temperature and the articular symptoms, disappeared but returned again with renewed force when the renal function became normal. In the second case the subchronic glomerular nephritis, which was diagnosed after the articular symptoms had disappeared, developed into uremia, during which new articular symptoms appeared. In the third case typical rheumatic fever was followed by afebrile hemichorea, and the symptoms of acute nephritis developed immediately after the choreatic symptoms had ceased. In the other cases the symptoms were those of ordinary acute and chronic glomerular nephritis with hypertension and hematuria. None of the patients had the lumbar pain that is said to be characteristic of rheumatic nephritis. The lumbar pain was lacking also in the ten cases of rheumatic nephritis which were found among the 212 cases of rheumatic fever which were treated at the clinic. The author says that rheumatic nephritis seems to be more frequent than was supposed formerly, because at his clinic ten cases were detected among 212 cases (4.7 per cent) of rheumatic fever and six cases among 287 patients (2 per cent) who entered the clinic with the diagnosis of nephritis. He points out further that salicylates have been regarded as a causal factor of renal symptoms. However, Rosenthal, who investigated this question in 420 cases of rheumatic fever, emphatically denies a deleterious action of salicylates on the kidneys. Edstrøm calls attention to a considerable parallelism between diffuse glomerular nephritis and rheumatic fever as regards not only the pathogenesis and epidemiology but also the geographic distribution, the seasonal variations and to a certain degree also the age incidence. It might therefore be more than a coincidence that rheumatic fever was found in the history of twenty-nine of 287 cases of acute and chronic nephritis, of which six are described in this paper as rheumatic nephritis, while seventeen were chronic with unknown etiology and onset, and rheumatic valvular disease and hypertensive nephritis occurred simultaneously in seven of these.